### **DEC** foothold in Japan

into the highly protected Japanese public sector computer market has been scored by Digital Equipment Corp. The company has supplied a \$200,000 PDP-11/70 to the Japanese National Tax Administration Agency, which could lead to DEC winning a major contract to equip 500 local income tax offices.

A NEW 8-bit ECL processed bit be introduced that use its "fast" bipolar process.

### **Calcomp** plotter

A DRUM plotter with a drafting speed of 42 inches per second, claimed to be twice as fast as any other drum plotter on the market today, has been introduced by Calcomp. Called the Model 1055, the plotter provides a resolution of 0.0005 inches and can operate offline with a Calcomp programmable graphics controller or online with most

included in the latest State of the Art report from Infotech, entitled, simply, "IBM".

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### APEX may black ICL systems at British Aerospace

AS a result of its continued refusal to meet a main computer centre in Chester. recognition demand from 40 of its computer systems design staff, who are members of have been working to contract since the No reply had been received when

new advanced software team

Warren Point, at Welwyn,

Rhodes (above). He Joins War

ren Point from the Royal Radai

Estabilahment in Maivern where he has worked on contro

nd simulation projects. In his new position, Rhades

will lead a team working on

mulation projects.

to be formed by consu

No reply had been received when Com-

the Association of Professional, Executive, beginning of October, and APEX has said puter Weekly went to press. The union says Clerical and Computer Staff, British Aero-that it will support them by issuing instruct that production of the company's 125 space is faced with the threat of company-tions to its 10,000 members in British Aero- jet and the operation of accounting and wide blacking of its two ICL systems at the space not to handle work originating from administration packages could be affected.

# SA embargo 'a cosmetic gesture'

The embargo also extends to

councils, since they perform the

same functions as police in the

The computer embargo,

which became operational in

February, does not apply to the

Department of Customs and

Excise; the Department of Jus-

tice; the Department of Health:

licensing authorities, or the

Research, which, according to

the United States Department of

Commerce, is not strictly a de-

fence establishment since it car-

ries out research for private as

They also point out that most

of the municipalities, which

their equipment even though

Threat of word

processing

THE belief that the services in-

dustry will take up the unem-

ployment caused by the micro in manufacturing, could be de-atroyed by word processing which would also lead to the increased unionisation of secre-

well as military organisations.

From Esmond Frank in Johannesburg

AT a time when there is pressure controlled arms manufacturing on the British government to industry; the Bureau for State introduce a ban on the sale of Security, and the South African British-made computers to some Railways Police. South African organisations, details of a similar American ban law enforcement officials and have been clarified - although traffic inspectors employed by there are doubts in South Africa municipalities, and provincial about its effectiveness.

An announcement published by the US Department of Commerce specifically prohibits sales of computers or computer components to South African police or military entities, which

are defined as the South African Police: the South African Defence Force; the Department of Prisons: Armscor, the State- National Institute of Defence Online end-user reporting

> The local computer industry sees the US embargo as nothing more than a "cosmetic gesture" to the United Nations, since there is nothing to prevent Government departments that are not covered by the embargo from sharing their computer facilities with departments that are covered.

It will be available on medium and large Burroughs systems

control local traffic police, use British-made ICL equipment. And they add that the Cape Provincial Administration, with an American Univac, and the Transvaal Provincial Administration, with a dual Burroughs 6700, do not appear to have any CONFIRMING earlier reports difficulties in getting spares for

# nearly doubled

CTL dld £1.5 million business in maintenance and services,

A FIRM "nothing has been decided" from GEC greeted a report this week that its venture with Fairchild would involve a at Neston near Chester making existing Fairchild micro and memory products, that it would be capitalised at C10 million initially, and headed by Don

roughs, is compatible across the to a local or remote printer or to complete machine range from the VDU itself. The package operates both on database files held by DMS II and on simple files, and is avail-

that it achieved turnover in excess of £5 million in the year to April, 1978, Computer Technology has announced that pre-tax profit almost doubled to £336,000 on turnover up 25% at £5,032,000 in its last financial year. The company projects sales in excess of £6 million in

Brown of Fairchild.

able immediately for use on B1700/1800 hardware.

## **CTL** profits

and exports were £1.08 million.

#### search director of white collar nion ASTMS. Speaking at a conference on word processing this week, Sherman said the ACARD

report on the impact on (CW, September 21), was "totally disreputable" because it did not mention word proces-



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they both maintain out-of-town traffic police forces, while the South African Raliways Police payroll runs on SAR's IBM 370 equipment.

d'Agapeyeff, believes that the with a 148 this week, as a stop VTP could stimulate the market for add-on devices for viewdata. and that the MicroCobol pro-

## **CAP** software option on

A MASS market for the distribution of software by view- 370, but we have a large number data has been opened up by a of customers for our older no development by CAP-CPP. Programs written in MicroCobol

RUPA DP manager Tim Fow can now be loaded via the Post Office's viewdata service, Prostel, into a variety of micro- and minicomputers using a hard- have involved equipping to ware and software interface other computer room Teles from CAP-CPP called Viewdata Terminul Programming.

MicroCobol is the machineindependent language and operating system developed for microcomputers by CAP-CPP 24, which we plan to do with backing from NRDC and August, Telefile will take or the National Computing Centre

and users alike.

# viewdata

puters is health insurance specialist BUPA - and the machine involved is the Gim installed a General Electric Gov in 1967, and wrote most of he applications in the macro

(CW, May 25). CAP-CPP chairman, Alex

The TCP-24, which is an AMD 2001 bit-slice entulation of the grams could increase the use of G400 claimed to offer four time Prestel or other future viewdata the throughput (CW, March 2) systems by making them easier will enable BUPA to continue to to use for information providers run its GE software unchanged for another 10 years.





Terminal Display

Systems Ltd.

Telefile fire

compatible

customer

BUPA's problem was that a

assembler since Cobol used up

too much core; there is no direct

successor to the G400, so a more

to a more modern machine:

would have involved rewning:

"All our new insurance po

ducts are processed on our BY

"Honeywell proposed to al

us a second G400, which well

solution allows us to relical

the old peripherals with its

modern ones, and where the

replace the processor where

plug-compatible Telefile 113

maintenance from Honeys:

BUPA replaced its 370 136

gap to the 3031 it has on order

this week."

all the applications.

told Computer Weekly.

Number 626

number of recent announcements, in-

(see page 7).

cluding the database-oriented System 38

System R, which is currently under-

engine manufacturer Pratt & Whitney in

Connecticut, has been under develop-

ment for some years and could be IBM's

main database thrust, running under an

extended MVS, when the new large-scale

H series is announced within the next two

years (CW, August 31).

Thursday, November 9, 1978

IBM in thrust towards relational databases

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## Briefing

### Plessey goes into electronic FIRST UK customer for oned

Telefile's plug-compatible replacements for obsolete on: / JOINING the ranks of firms pressing ahead with develop-ment of the all-electronic "office of the future" is Plessey, which is beginning to recruit staff for a specialist group on office systems bused at Beeston, near Nottingham. Word processing, electronic mail, high-speed facsimile, and intelligent copiers are all fields in which expertise is being accumulated.

Plessey is moving in this direction as part of the convergence of word processing with its existing communications technology. The PDX Private Digital Exchange launched in February (CW, February 23) was designed for future integration into text handling systems. although no product is expected in this area for at least a year.

### More power to NCR

A THIRD, more powerful model has been added to NCR's 1-8200 line of interactive small business systems in the US. Offering subit is none power than the

ex. Jun; 1-8230 and 1-8250, the tow 1-8270 supports from three to 24 workstations, and up to 320 Megabytes on disc.

### Strikers relent

STRIKE welat workers in Newcastless a Tyne have ogreed to allow computer maintenance engineers through their picket lines around the town hall. They had been keeping ICL's mainte-nance staff out, and fears had been mounting that the three 1904s would stop working, preventing the payment of staff salaries, rent and rate rebates.

### \$10m theft charge

CALIFORNIAN computer consultant Stanley Rifkin has been thurged with stealing \$10.2 million from the Security Pacific Bank of Los Angeles by mampulating the bank's electonic lunds transfer system. Rifkin, who is not in the bank's employ, allegedly broke its security system and caused the money to be paid by an automatic system called "wire transfer" to a bank in New York and then to Zürich, where he bought diamonds from a Rusmoney has been recovered

### compiler validated

A PE Cobol ANSI 74 compiler welfored by NCR for use under VRX operating system has the successfully validated by the Federal Compiler Testing struct in the US. Compiler Hiddion is a prerequisite of the thing hiddion is a prerequisite of the thing hiddion.

### Inivac man for ICL

ORMER managing director of hivac's Australian operations. Wells, is to join ICL Aust-

#### THE importance to IBM of relational moving ahead with a variety of systems IBM's Italian Scientific Centre at Bari. databases has been emphasised by aimed at tackling the vital issue of the reports that its System R relational languages used to access information. DBMS is in advanced phases of testing at The company recently announced The company recently announced in

a number of large US sites and by a the US an interactive query system originally associated with System R, called Query-By-Example (CW, November 2) and has other major projects in Japan, West Germany and Italy concerned with going second stage "beta tests" at aero- user-oriented database languages.

The work in Japan and West Germany is based on one of the company's other main relational projects, the Peterlee Relational Test Vehicle.

There are two natural language inquiry systems based on PRTV, and a further ears (CW, August 31).

But in addition to such basic "driving APL, which is supported by yet another engine" system software, IBM is also prototype database being developed at

cept that is said to be particularly well adapted to the syntactical structure of In West Germany, IBM has developed a system called User Specialty Language

a subset of German and English state-

in common the ability to accept enquiries

from end-users in a relatively unstruc-

The Japanese development, under the

name Yachimata, is a system which

accepts natural language queries and

displays a "data table" in response. It uses what IBM calls the "noun-phrase" con-

which enables users not only to query a database but also to update it. Accepting

ments, it is apparently designed to be All the languages are based on variations of the relational approach, and have cular end-user environments customised to the terminology of parti-The capability of a system to provide

"natural" language interfaces for end users was one of the chief design objectives of System Q, the operating system intended for IBM's Future Series project (CW, June 14, 1973) which was killed as such four years ago but whose design principles are likely to appear increasingly in new IBM products.

 A glimpse into the likely shape of iBM databases was given (CW, October 19) by Max Stewart at the start of his 10 part educational series on relational databases, which continues this week on

# CDC venture a survives in Iran

#### By Tim Palmer

DESPITE the fact that some of Iran's most ambitious computer projects had been going wrong before the current outbreak of violent unrest in the country, many Western computer companies are standing their ground, hoping the political situation stabilises. Most significantly, the Plato terminal manufacturing venture involving Control Data and Electronics Industries Iran is still proceeding.

ture and a spokesman for CDC

in Minneapolis told Computer

Weekly that contingency plans

had been laid to evacuate the

company's employees if the

situation deteriorates further.

but that work is continuing

The UK subsidiary of Tera-

dyne Inc has completed the first

part of a two-part order for test

Turn to Page 26

But visitors to Telieran say that the Univac U10, ordered in a blaze of publicity for an earth. resources satellite project (CW July 31, 1975), is at present being used for little more than payroll, while at least one large computer has been languishing, still crated, at Teheran's Mehr Abed

airport for many months. The CDC venture, which is 30% owned by CDC and is called

### and non-scientific subjects. The school hopes to acquire some monitors from a television company to fit out a laboratory with repeaters for the machine's display. Computer Terminals of Iran, is intended to manufacture a new Beating the S Africa blockade

ment's arms embargo (CW, De

cember 8, 1977), the South Afri-

can government has climbed

down and ordered the CIT-

Alcatel E10 digital switching

system. The change of heart fol-

lows assurances that the ex-

changes would not subsequently

SUPPORTING the doubts of tions, a spokesman for the US companies within South Africa Department of Commerce in that the US ban on the shipment Washington told Computer to South African police and de-Weekly that it had no evidence fence forces of US computers

# SCENE

One of the major battlegrounds for information technology is going to be the provision of electronic mail services. In this month's international section Morris Edwards. Sizes up the competition and looks at the position of the main rivisis, IBM and AT&T. In Marketyiew fred Lamond exemines the impact of IBM's 8100 and its effect on the use of SNA. Washington Report use of SNA. Washington Report considers the rise in DP imports and exports in the US; and News from America reports on how the phone phreaks have jetched on to the computer terminal. Emploid Frank covers some of the latest Frank covers some of the latest

confirmed that the US government was aware of the allega-"We would like to hear about it if it is happening," he said. "If such a thing is going on, such companies could face civil or

perhaps criminal action." Meanwhile, one year after suspending a contract with CIT-Alcatel of France, for digital elephone exchanges in retalia- tions network.

be embatgoed on the grounds of technology transfer. Siemens has been awarded a similar contract for its EWSD digital system which is still at the prototype stage. The South African government is planning to invest some £3,000 million in

modernising its telecommunication for the French govern- More on South Africa, page 27.

IBM charges warning Downtime by Chad

Participative systems design

Cheque scanning system . . . Michie's Privateview

### WHAT USERS WANT.

To give users a more effective say in the design of systems, a technique of participation has been developed by three specialists in computers and systems management. This week we begin a five-part series outlining this technique and its benefit to users. Page 4

#### range of terminals specially de-Siemons back signed for use with the CDC Plato educational time::lcaring system, CDC has employees in MIREE yams whom it was offer Teheran co-ordinating the ven-

mainframe market by the with-drawal of CII from Unideta (CW, May 16, 1975), Siemans is to re-onter the market with a new subsidiary, Siemens Data SA. Unidata was a collaboration Siemens and Philips, and when it collapsed, Siemens was left with no marketing organisation in France. The company will now have to establish a new.

arketing network,

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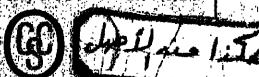
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# A SIGNIFICANT breakthrough

The computer was procured by the large Japanese computer and electronics company Nippon Electric, and DEC believes that the tax authority specifically requested DEC hardware. The move is seen as possibly heralding a relaxation of the government's strict buy-

Fairchild launch

slice microprocessor is to be introduced by Fairchild, together with a single chip microcontroller which will include EPROM on the chip. The company is pushing hard with its bipolar device developments, claiming that by the end of this year, a turther 51 different circuits will

### mainframes and minis.

**IBM** forecast PREDICTIONS about which new products are expected from IBM in the next decade and which new markets and industries the company will enter are

software from Burroughs ONLINE end-user reporting software, announced by Burautomatically, may be directed

Line Reporter, the software is an enhancement of the Audit Reporter Package introduced early in 1977.

The package is driven by simple English-like instructions. from the second quarter of 1979. entered by the user at a VDU. It

#### file access, file sampling, the creation of new files, and report totalling and printing.

provides facilities for selective

B1700/1800 systems up to

B7700/7800 systems. Called On-

**NEC** for Olympics ONE of the major computer contracts associated with the 1980 Moscow Olympics has gone to Nippon Electric of Japan. The company has won a \$1.8 million order for a hospital automation system involving 19 NEAC-100 small business computers and 84

terminals for use in eight new the current year.

### Chester plant

tarial staff in private industry, according to Barrie Sherman,

## • Full report next week.

370/135.100 fully featured 370/145.102 fully featured

terms.

### 370/148.K00 3047, 3286

#### of embargo-busting by Ameriand components is not effective can companies, although he (CW, November 2), there have been indications of how computer spares may be slipping

Girls at the independent Norwich High School now have their own

computer — a Research Machines 380Z microprocessor system with television and cassette interfaces. They will also soon have a printer, which to save money the girls are building themselves out of a kit from South West Technical.

rom South West Tochnical. Dr Paul Stevenson, head of physics, who is pictured here with

some of his students, believes there is a strong caue for provision of special computing resources at girls' schools. "Girls have been neglected by technology for too long," he says.

All programming is done in Basic, and eventually it is intended that every girl in the school will learn how to program, both for scientific

past the blockade. US government sources have said that shipments of spares are suspected to have been made from Switzerland and Austria to South Africa, while South African sources have added Southern Ireland and Liberia to

Commenting on these allega-

INTERNATIONAL

Pages 23/32

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## How to avoid that cow manure

all know, full of jargon and cliches (vide Angus McQuibble article, CW, October 12). It also has a tendency for the vulgar term for which can, for polite company, be expressed as "cow

To anyone in the industry there are certain facts which are commonly assumed, such as the gross overselling of systems in the Sixtles where there was little evidence available to seller or buyer that the systems could do what they were supposed to do.

As humorously illustrated in

Programmer Notes (CW, November 2), project management of systems implementations has almost inevitably led to failures to meet deadlines and when the deadlines are met, it is usually found that there is a fault in the systems design which fails to take Into account some aspect or other of user

The communications media, including the Press and conference organisers, sometimes play a role in the cow manuring process by identifying, writing about, talking about and providing learned papers on important issues such as database, the micro revolution, etc.

Like those ordinary men who might read the letters columns of magazines such as Penthouse

HERE is another of those "look

what the computer has done wrong this time" sagas to add to the legion of Emillion gas bills. As usual, it is a programmer, notthe computer, that has induced the fault, but it does show one saving grace. Whoever the programmer be he or she is obviously a person of intrinsic honesty, for not once has the problem of theft been considered — and that is what this saga

At the warehouse of a well known record company, the stock records of all the platters stored there are held on a computer system.

stock of one particular ditty was stolen by a suitably unscrupulous person, so nothing now exists in the rack. However, there seems no way of informing the computer of this particular

impasse, or "deadly embrace," as some might say. The company cannot order any more from the record pressers, for the computer program says it still has some. Every time an order for the number comes in, the program promptly issues a dispatch note for items that don't

program cannot tie things up nicely by sending off an invoice

The moral is that deadly embraces, however tuneful should be avoided at all costs. Submitted by a frustrated record dealer, in London.

am I missing out?", people in the the finger of blame at any partiindustry might well be led by the stream of information on the cular group, for generally each latest techniques (brought to a white heat by salesmen trying to achieve their budgets) to a de-DP departments have a tough sire to emulate the supposed

time reconciling their user needs achievements of others. with their resource and techno-Putting on and taking off logical capability, and manufacturers have their crusts (plus trends with the tempting speed of Penthouse models and their butter and lam) to earn. clothes, the computing industry Journalists and conference has already lived through such organisers also have a hard tob "golden oldies" as database pointing to the future while management systems and distributed processing and is now into micros and word proces-

keeping up with today. So, what can be done about all this? One bit of action could be sing, which are on the brink of to lash out on all sides and cry becoming a bit old hat. There are Woe! and Shame! as did the also recurrent raves from the recent BCS report on User graves, like the much anrequirements in DP (CW, nounced death of the punched

The vague conclusions of this report are worthy of notice, but too nebulous to be put into

in practice, the only solutions (if any) will be found, firstly, when there is an improvement in

out the country, particularly among managers, on the subject group in isolation is doing its of the reality behind the combest in a complex, changing puting cow manure; and secondly, when the computing professional starts seriously attacking the question of good

reliable, user-oriented systems On the wider awareness issue, there are signs — such as the Department of Industry micro education scheme, and awareness among unions and training agencies of the importance of this issue (CW, November 2) that those responsible for implementing the action are

getting the message. On the question of improved professional standards, responsibility rests on all those who run and develop systems to take

And it is to be hoped that an obligatory part of any training course relating to computing will include a guide on how to identify and avoid cow manure.

# FOOLS Spreading the blame

IN the legal world of contracts, software snags, whether comthe varied assortment of rights and obligations seems definitely loaded. In general the supplier has the rights, while the user often picks up the obligations.

conditions offer little comfort to

tifled with the recorded abuse.

card or dawn of the OCR era.

Yet few users, for example,

can point to genuine database

systems or distributed proces-

sing networks; genuine in terms

of philosophical design alms, not

practical muddling through.

Maybe, however, the scales of justice are about to be tipped. As reported (CW, October 26), two care in this case being that inorganisations, the Computing Services Association and the Institute of Purchasing and Supply have both had working parties beavering away on matters of

Some six weeks ago, the entire memory, the related terms and

Particularly onerous are the This has led to a kind of restrictions as to use. Should it cross the DP manager's mind to use the CPU as a drying closet, he would be well advised to desist. Should the shift leader consider replacing a blown fuse, again the advice is to refrain. Initiative should be discouraged. The manufacturers' memory banks are noted for their longevity, and any subsequent hardware problem will be iden-

And as the thief left no forwarding address, and failed to fill out a proper order form, the

The IPS working party has

pited in Detroit, Cologne or Godalming, are at a loss when converting English legal niceties into a meaningful language. No wonder, then, that DP management often sign the contract hoping for the best; reasonable

stinct suggests that the organisation concerned will honour its obligations — without screwing all in sight. In many cases, it is sheer disinterest which motivates the First report to surface is the DPM in his neglect of the small CSA Contract Guidelines for print. Often, though, it is wilful

puzziement as to what it all omputer Services. This covers consultancy and bureaux services, systems development and All too often, the procedures software product licences - an and regulations governing any particular contract can be overincreasingly thorny area of computing. Meanwhile, the ruled by the law of the land. spikey area of hardware con-Interfacing industry contracts tracts is being dealt with by the with relevant legislation takes IPS. Whether it is an order for more than a single file sort. two-part stationery, or add on

Maybe it is time for installation management to issue some contracts of their own. These would be produced on standard print-out listing with a clause exempting any "bugs" which might have escaped notice. The first clause would exempt the installation from any equipment mishandling by the DP team. While every endeavour would be made to keep the novice operator and/or computer trolley under control, subsequent onsibility is limited.

Smoke detectors are notoriously sensitive and even the best maintained system has been known to trigger related fire sprinklers — particularly on ditions for computer related gone home. Suppliers should contracts. These could well be- also make allowances for such come standard installation everyday happenings as split issue. Many DPMs who quite coffee on the control panel or anti-static polish on the disc

protected from the user - especially where late completion of their new applications are

Taking the blame has become an accepted part of the DPM's life. Perhaps it is time that some of the blame was contracted round the industry.

# Basic/Fo

AIMING for a rapid gross.

UK market share, MAIh uired its UK distributor Four (UK) Ltd (CW, 0

There are three main as MAI's US business: Bake Corp, which manufacture. markets a range of smur ness systems under that. Sorbus, a US-wide thin; maintenance company.
Wordstream Corp. w manufactures shared by processing systems.

Together with the internal operations, which is subsidiaries in German land, Switzerland and Be and since last week, the li France, MAI is a \$200 c

> MAI's main UK though mmediate future will Basic/Four systems, dihere are four models, the 410, 610 and 730. There is different processors de around MAI's propo operating system white optimised to run Busines! II efficiently; Basic is the language offered. The company used page.

rom Microdata, ending w the Microdata 1600 in 1971 which it started to build in

prices for the Basic/Fowls 32K-byte processor, one c 10 Megabytes on dix 19: printer, cartridge upeds::: system software costing i. a 410 with 56K-besome ntavs 14 Megalidadāra 160 chps printeres (4.5) and at the top 663 15. System 730 with each 150 Megabytes on disl pm printer costs £89,0 and 100% better performance than the 370/148, depending on

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# MAI take IBM's charging for software 'could backfire'—Magnuson

THE policy change at IBM under which users will be charged for all newly introduced system software and software enhancements could well backfire on the company. That is the view of Paul Magnuson founder and chairman of Magnuson Systems Corp, the company established to design, manufacture and sell a radically new kind of plug-compatible processor.

ware companies out there just

waiting for IBM to give them the

tem software business," he told

IBM has been able to achieve its

objective of having one common

centralised system control pro-

soon as it starts charging more

than about 10% of the hardware

price for software, it will let the

ndependents in. At 20% of the

hardware price, a number of in-

dependents will start competing;

a 40%-50% price ratio would let

The risk has not gone un-

noticed at IBM — individuals

have intimated in private that

they are very worried about the

problem, and are uncertain

about the right approach.
With IBM's extremely

aggressive pricing policy on its newest hardware products, par-

ticularly System 38 and 8100, the

company appears to have de

nuson underlined the dangers

"It takes, say, \$20 million to

Microdata

sued

A 690 million suit has been

filed against minicomputer

manufacturer Microdata by Pick

and Associates over the right

to the Reality software. The

suit, filed in Orange County, is in the form of a cross-complaint to Microdata's initial complaint

of August last year. It elleges nine causes of action, including violation of California anti-trust

laws and misappropriation of

Research Machines' Z80 Algo

isystems and is sold by Research

Machines under licence. Both

MARKETING and support

throughout Northern and

Overall Fixed Assets and is a

batch system written in Cobol to

run on most mainframes to

handle depreciation of firm's

fixed assets on an historical

for Ireland

trade secrets.

sold in the US by Research puters systems as small as 20K.

the whole world in."

By giving away the software,

opportunity to get into the sys-

Computer Weekly.

### European agent for the M80

AS forecast (CW, June 8), Magmison Systems Corp of Santa Clara, California, has appointed a European agent. The agent, Magnuson ATC, is a whollyowned subsidiary of the Intair Group of London, a company specialising in technical services io airlines.

Magnuson ATC will initially market the M80 series of IBMcompatible desk-sized mainframes to European airlines. Target applications are cargo services, engineering, reservations back-up, ticketing and departure control, and reservations for smaller airlines.

cided that it must get a bigger return from software, but Mag-A second Intair company, Magnuson Middle East, has been formed to sell throughout the Middle East and North graphically. Africa. The agreements do not preclude Magnuson from

signing other European agents.
The first M80 mainframe was shipped to Fairchild, the compuny, which has a 32% stake in Magnuson. The second has gone to Mitrol Corp of Boston, which markets a manufacturing software package and previously used the National CSS bureau. Both were M80/4s, which are claimed to offer between 20%

applications. Magnuson is currently producing one machine a fortnight. By January output will be one a

Machines, of Oxford, in what it

by one man or by very small teams," he noted, citing CP67. gram for all customers. But as example.

Paul Magnuson expects the operating system on IBM's Eseries replacement for low and mid-range 370s (CW, August 31; to be a superset of MVS with some modules available only at a monthly licence fee.

rapid decline in the price of hardware will continue right through the 1980s, so that within a decade, the E-series will offer a price-performance 25 to 30 times better than that available today.

"There are many little soft- get a hardware plug-compatible emulator off the ground, and the number of companies doing that is growing. But for software you need just one bright guy: in fact most of the best software products have been designed either the forerunner of VM/370, as an

> Ho is currently chairman of NatWest's computer output He also anticipates that the

Management Services Centre at Goodmans Fields, near Aldgate.

3000, will dominate the Documentation stand at the biggest and best Compec exhibition staged so far. The DOC 3000 uses band technology. and is offered as a low-cos back-up device to the IBM 3800 laser printer.

OVERALL responsibility for data processing and clearing operations at National West-minster Bank will soon be in the hands of Cyril Townsend, a manager of the bank's management services division on De-cember 31.

microfilm bureau subsidiary. Eurocom Data (Holdings) Ltd. Townsend's new job will in responsibility for

NatWest DP chief

former managing director of NatWest's Centre-file bureau, who is to become general

NatWest's new London

#### AN impact printer running at a mind-boggling 3,000 lines per minute promises to be one of the prime topics of gossip around the bars and estaurants of Olympia next month The printer, called the DOC Freedom of information setback

COMPUTER WEEKLY, November 9 1978

3,000 lpm impact printer

talking point of Compec

Compec, in the National Hall, NO lov for the Freedom of In Olympia, will open on Tuesday. formation campaigners came out of the Queen's Speech last December 5, and close on Thursday December 7, and those week. Instead of any specific wanting to attend should apply promise of legislation, the immediately for free prespeech simply said: "It remains registration tickets to avoid my Government's intention to having to pay £2 on the door. replace Section Two of the Official Secrets Act, 1911, with a pec Tickets, Room 821, Dorset measure better suited to House, Stamford Street, London present-day conditions."

The speech continued: "The Government will continue to make information on public policy more readily available."

This will not satisfy those who want a statutory right to information established. Robert Kilroy-Silk, Labour MP for Ormskirk, said this was "disappointing, not to say disgraceful, given the clear undertaking in the 1974 manifesto."

### Exciting things happen with Prime Computer

Applications should reach Com-

SEl 9LU not later than

THE Icelandic PTT is Scicon's

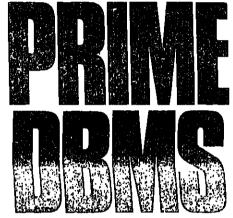
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November 22.

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# Ten years ago...

**COMPUTER WEEKLY** 

NOVEMBER 7 1968

AS the first step in a scheme to advance computer education in schools in its area, Glasgow Education Department installed an IBM 1130... To extend its services to smaller users of clearing banks, the Interbank Computer Bureau Introduced OCR techniques... A consortium of Trustee Savings Banks in

Research Machines to Newbury Labs' Jatest range of British VDI sell Z80 Algol in US High speed, paper tape reader punch. AN Algol compiler for Z80-based ral language. Our Algol is cap-From £995 microcomputer systems is to be able of executing on microcom New 1-1612 160 c.p.s. bi-directional TALLY keyboard printer. Wide range of other Tally printers also available: From £1935 LA36 DECwriter II From **£86**: digital LS120 DECwriter III

describes as its "first positive also originates from RHA Min step into exporting". In addition to the Algol compiler, which runs under the companies sell the complete popular CP/M operating sys-range of compilers as a joint tem, the company will also be selling another CP/M software package, Z80 Assembler. Other products to be offered Inflation package include Algol compilers for DEC LSI-11, PDP-11, PDP-8, and From £1995 PDP-12 machines. Originally written by Roger Abbott, of RHA Minisystems, these already have a number of US users. From £1860 The first outlet to be identified puting's SOFA inflation accounfor the CP/M software is ting package is to be maintained. Lifeboat Associates, a New Beecom, the Belfast software house. SOFA stands for Safe's From £210

April - nased software wholesaler inforetailer. Run by Tony Gold, this is also the home of the CP/M Users Club library.

Research Machines is best known for its 380Z microcomputer system, based on the Zilog Zana. Explaining the move into selling software on its own, director Mike O'Regan commented: There is a strong interest in Algol-like languages such as Pascal and Coral. Typically, though, a microcomputer needs t least 56K of RAM to be able to fun Pascal and this is beyond the mit of many systems and

"We believe that many users will turn to Algol itself to satisfy their requirement for a structu-

TO aid in the analysis of medical University has installed a 128K Digico M16E system with 11.6 byte of disc storage, and two

Medical surveys analysis

surveys, the Department of Community Medicine at Leeds Digico software, packages that will be used to emulate ICL 7020 and 7180 terminals.

### Ruthless **EOJ** routine

KNOW Americans have a reputation for being ruthless, but it's seldom one gets such a graphic experience of this first hand as I had when I was visiting Los Angeles recently.

for the hotel desk when I noticed the two out-of-state American gentlemen in front of me were having difficulty with their reservation. They insisted that the booking had been made by their firm. Eventually the manager was called, and he arrived carrying a tolex sent to the hotel by their "employer."
"This," said the manager,

waving the telex before them. "says that the reservation has been cancelled because you don't work for them any

What a way to give someon the sack! The last I saw of the two gentlemen, they were being ushered away to the manager's office in a state of understandable shock Remember that, the next time vou complain about your

Fit of the

THE DP industry is getting old enough now for people to reminisce about the Good - or Bad — Old Days. An acquaintance of mine was talking about his years in the late Fifties at an IBM installation at a drug company in Hounslow. They were having a ot of difficulty with accuracy of input data, and he set about investigating the staff selection procedures.

Among the denizens of Hounslow, it appeared that those school leavers who could get good jobs would travel to central London for these Those left would be employed by this firm to deliver the in Of these, the girls who kept

leaving the letters at the wrong offices, or dropping them down the drains, were put in the post room sticking stamps on let-

Finally, those who kept putting the stamps on the wrong corners, were made data prep The management, of course,

were very impatient with the computer, which didn't seem to be delivering the goods. To paraphrase the old tag, "Who prepares the data preppers?"

## Participative systems design

A BCS survey of DP user requirements was highly critical of the failure of systems designers to include the views of all users in their design

specifications (CW, November 2). A technique of participative systems design aimed at overcoming this type of criticism has been created by three specialists in computers and systems management, ENID MUMFORD of the Manchester Business School, FRANK

LAND, senior lecturer in computers and systems analysis at the London School of Economics and JOHN HAWGOOD, director of the computer laboratory at Durham University.

Their technique sprang from a project initiated by the National Computing Centre about eight years ago to look into the economics of computer systems. The more they looked into this subject, the more they realised it depended primarily on

renlaceable commodity which

produces at highest efficiency

and lowest cost when few de-

mands are made on it, when

work is tightly controlled and

the way the system was designed. These techniques have now been in mented at a number of user sites and

specially commissioned series of five at Mumford, Land and Hawgood will describe technique, drawing on their implementation periences of the technique, which they all vides "new design methods to cater for the climate of democracy in industry."

# I was standing in the queue for the hotel desk when I noticed the two out-of-state American gentlemen in front of me were having difficulty. Taking Users neglected the queue of the hotel desk when I noticed the two out-of-state American gentlemen in front of me were having difficulty. Taking Users neglected the queue of the hotel desk when I noticed the two out-of-state American gentlemen in front of me were having difficulty. into full account

Designing systems for a new and rapidly developing technology is also an evolutionary process. one which involves constant learning as new or changing quent articles. needs are identified in the system envornment, and as intelbe effective at another.

The design of computer systems today is being increasingly influenced by major social and technical changes. Socially, there has been a shift of power from the top to the bottom of most organisations. This has been accompanied by increasing demands for involvement in decisions that affect lower level workers on the shop floor or in offices and a willingness to use employee power to block change which is viewed as undesirable or disadvantageous, in particular change which is seen is leading to a reduction in Jobs.

Technically, the advent of microprocessors, while increasing the potential scope and flexibility of computer systems. seems to some to augur a realsation of the worst employment fears of the past.

The design of computer systems is therefore increasingly becoming a negotiating process in which all interested groups require a role in the analysis of needs, setting of objectives and design activities.

For many types of applica-tions the day of the lone systems designer is over. Therefore new design methods are required to cater for the new climate of democracy and to ensure that users receive the kinds of systems that meet these needs, because they have had a responsibility for the design of the sys-

We have over the past few techniques that will fit a new, years been developing a philo-sophy of system design and for-values.

plex and demanding process. and user participation and a set of procedures to assist the participators. These will be outlined in this first article and discussed in more detail in four subse-

All systems design is inlectual approaches which philosophy. Top management worked well at one time cease to values will influence the kind of

Enid Mumford

strategies they use to ensure the

economic viability of their or-

the human relations climate

they wish to create for their

staff. The values of the computer

professionals will influence the

set and the importance they

kind of system objectives they

attach to such human needs as

The values of user groups will

influence the manner in which

they respond to computer sys-

tems and their enthusiasm or

reluctance to ensure that they

work. But values today are in a

state of flux, and this is one

reason why there is pressure to

reformulate these and to deve-

lop the new approaches and

ganisations and the nature of

dominance of a technical ethic, ning it. influenced the design of many early computer systems.

> The developing computer: ethos assumed an increasing misanthropic visage. Technical matters turned computer professional on: human matters turned them off. Users were troublesome netitioners somewhere at the end of the line who had to be satisfied with what they got, because after a sub-

apparently unsatisfactory. In and in efficiency. Britain most systems designers user needs and provide the kinds of systems that users will welthis and have been met with a outside group of specialists. hostile reception from manage-

usually couldn't go elsewhere."

ment and subordinates alike. Can our method help improve this state of affairs? We believe it can, and now have experience of testing it out in six different organisations: a savings bank, a public library, an insurance firms. It is also being applied by groups in Germany and the US.

The approach is based on a clear value position, which can be stated in the following pro-

1. That the individual's work

the past have tended to see should be set up in such a way labour as an expendable, easily that he or she can do a job that is personally satisfying in a safe and comfortable environment. (The computer can and should be a means for assisting this.)

2. That everyone affected by when little or no discretion is a system change, including allowed to the individual worker users, customers, management or to the work group. These and technologists, can and values, together with the should be considered in plan-

3. That employees at all levels can and should analyse their own Sackman describes the sysand their clients' needs and design their own work systems. ems design scene of the 50s and 60s in the US in the following 4. That the overall approach to

systems design and development can and should be based on the approach of enabling the organisation, the group and the individual to cope better with uncertainty. The argument behind these

statements is related both to ethics and to expediency. We believe that people have a moral right to influence the organisastantial investment, they tipn of their own work situation and also that if this right is The situation of the 1970s has conceded then there are likely to been very different, but still be gains both in job satisfaction

Job satisfaction gains, behave tried very hard to meet cause the group whose job satisfaction is going to be affected by any change is better come and appreciate, but able to diagnose its own job frequently they have failed to do satisfaction needs than is any

> Efficiency gains, because the people who are in the change situations are likely to have an excellent knowledge of day-today work problems and can make useful contributions to the solution of these.

If users are going to par company and three industrial ticipate in the design of their own systems, then they need both a structure to assist their participation and a set of simple analytical and design tools. These will be described in our next three articles.

Briefly, the participative

NEW\_DESIGN

0 - 50 CH/SEC

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or Systems

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approach involves first (fc strategy. When organizate objectives have been set a

broad system covering and of departments is being (loped, then a design gro; representatives of all the c. ests in these department created. Lastly, when a sub-syr and local procedures are b

designed for a particulard; ment or section, a cons approach is adopted with staff being involved a decision-taking. Both of design groups reported groups consisting of a management and lagi-

The tools used bytta. To assist the participance groups to acquire dege include methods folds -design and evaluat∈ 1. A method for

2. A method for identify: satisfaction needs and &

current efficiency to:

3. A method for identify significant trends and of; tunities:

4. A method for identify development goals importadifferent interest groups. 5. A method for assessing likely benefits of different & strategies to different gri

ise our existing approach

indicate develop

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1 Albert Street, Slough Telephone: Slough 21296/

Windsor House,

This assists the choice of assist young growth companies. effective course of ac-Dr Castell, who worked for acceptable to all groups. iternational merchant bankers. Bremar Holdings until earlier 6. Detailed socio-tech systems design to ensure t this month, told Computer the final system meets Weekly that the kind of growth as well as technical and company he is looking for. typically has a turnover of between £150,000 and about istrative, objectives The final article will se

£ 250 -10ff

operating at break-even but has signs of rapid growth to annual turnover and profits of about £5 million and £500,000 within two Capital in tranches of between

that in the computer services industry, frequently finds itself frozen out of the conventional sources of equity and loan finance or, if it manages to find OCASTELL can be contacted on accommodation it is often or

He explains his scheme by

pointing out that, "This type of

private company, particularly

processing, like the amount,

can capture it for DP purposes.

The information could then be

The system should also be

able to sort images. In the case

of images of cheques drawn on

accounts at branches belonging

to the same bank, sorting would

to assist young growth companies

banks could be substantially about 50 branches.

yet either of the hardware or transmitted to the bank's com-

each cheque deposited at the include sorting into branch

branch, transmitting the image order. The images would then be

puter centre.

lightened by a system that cap-

images of cheques. The system is

called Bancr, a name which

combines the names of its joint

developers, the Bank of America

software components of the

Bancr system, but one of the

known essential features is a

terminal that will be installed at

each bank branch and which

will be used to scan both sides of

information technology field

can now turn to a new company.

('ustell Computer & Systems

lelecommunications Ltd, of

Witham, Essex which has been

started with the ambition of

trying to help new technology-based firms.

Established by Dr Stephen

Castell, a long time campaigner for the provision of venture and

development capital for new

technology based firms, the new

company is acting on behalf of a

The state

CASTELL . . . . "overcoming some of the classical difficulties."

company of licensed securities

dealers in offering a scheme to

£500,000 and is currently

only severely disadvantageous terms to the, typically, founding and still managing technological entrepreneur owners Paradoxically, such a company can often show spectacular growth rates with the right sort of development finance back-

The new scheme, he claims. will overcome some of the "classical difficulties" associated with financing small, new-technology private companies by "floating" a pro-portion (usually between 20% and 49%) of existing or new shares, or a mixture, on the new Over The Counter "Exchange" Market into the hands of a wide spread of individual investors.

Castell emphasises that this will be carried out by his clients who are very experienced in these matters, with the utmost caution and attention to the regulations governing the issue of such securities.

"The Offer Document will be particularly clear and comprenensive and have something like 'Danger-You Are Entering a High-Risk Investment Area. Widows and Orphans with Life-Savings Keep Well Away printed clearly on its cover!" he commented.

The subsequent responsibilities of the "floated" company will be kept to a minimum. It is fundamental to the scheme that the existing management will be £50,000 and £500,000 is available, left largely alone to get on with according to Castell, and a com- the job of attaining the perforby shares may be valued on mance set for their company the basis of about two to three made possible by the new

### Guardian OS extended A SUBSTANTIAL extension to customers worldwide, and did

the Guardian operating system allowing Tandem 18 NonStop computer systems to be linked in distributed networks, has been announced by the company.

Called Guardian/Expand, the key feature is that the same automatic sharing of programs.

automatic sharing of programs and applications which takes place in a local multiprocessor Tandem system can now take place in a distributed network. According to Tandem the only difference which will be observed by the user is a slower response time from remote applications than from local

Tandem currently has some 0 processors installed with 80

about \$25 million of business in the year ended September 30. In the UK, the company has

received two orders from Bar-clays and two from the Ministry of Defence. The Barclays systems are one dual-processor handling foreign exchange dealing, and another acting as controller for a worldwide asynchronous point to point communications system connected directly to the channel of a twin IBM 370/158 system in IBM 2780 entulation mode.

One of the Ministry of Defence systems is to be used for code breaking at Government Communications Headquarters, GCHQ, in Cheltemham.

cheque scanning system

workload borne by clearing ting centre serving, typically, The system at the centre will branches of other banks would tures and processes electronic be capable of extracting inforbe outsorted and could be transmation that requires computer mitted to the Bancr networks of the banks involved, if such netfrom the rest of the image and works existed. displaying it so that an operator In this way Bancr would be a

viable and more acceptable alternative to the Electronic Funds Transfer System, EFTS. concept where cheques are totally eliminated, because Bancr dramatically reduces the amount of cheque handling, while enabling the customer to continue using his cheque book. Banks in the UK sec the bigg-

within NCR is concentrated at the company's special systems Castell's new venture offers scheme development centre at Torrey Pines, near San Diego in California. Problems being tackled there include extracting information from "picture" cheques, where the decorative piccertain minimal amount of conture can be confused with the tinuing reporting to the new relevant information on the shareholders would be required. cheque.

being misplaced.

them physically to the branches

they are drawn on in order that

creased ability to handle rising

cheque volumes without

sacrificing speed, accuracy or

control. Bancr would reduce or

greatly alleviate the problems

# Part Banks see big savings in Exam papers contract A CONTRACT Worth £77,000 for students the 20,000 university of 700 000 pieces evalights, was given to

automatic marking of 700,000 exam papers has been completed places evaliable, was given to Lowndes-Ajax after the Matricu-lation Board had seen the by Lowndes-Ajax, the Croydon bureau, for the Matriculation

bureau's advertisement in Com puter Weekly. In addition to calculating each tted by 100,000 students, each contained multiple choice answers to 100 questions. The

student's mark, the compute system had to apply standardisation formulae to bring the levels huge task of marking them, and of 18 from the results assigning to the of 18 different examin

#### the signatures on them can be **DEC announces 3271** Some of the benefits of Bancr anticipated by the Bank of America include reduced energy interactive software link and fuel consumption, reduced paper consumption and the in-

AN IBM 3271 protocol emulator PDP-11 emulators. has been announced by DEC for the PDP-11. The software makes the PDP-11 resemble a 3271 terminal controller, with each minicomputer task acting as a caused by individual cheques terminal to the mainframe. Programs running under

The Bancr development effort RSX-11 and IAS can thus communicate interactively with 360 or System 370 host.

PDP-11s using the protocol can share a multi-drop line with other devices using IBM's BSC communications protocol. The other devices can include true 3271 controllers as well as other

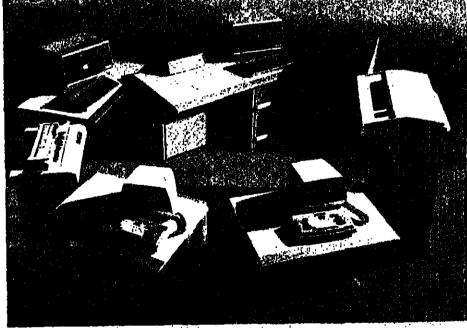
Priced at £3,050 with full

documentation and support, the package can also be purchased unsupported for £2,025. Multiple-sale licence-only price

### **Uister rights**

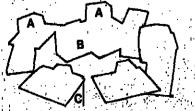
HAVING gained no satisfactory agreement with Queens Univerly, Belfast, over negotiating rights for its 350 members there, whom 60 are computer staff, ASTMS has passed the dispute to the Labour Relations Agency, the Ulster equivalent of ACAS.

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### EILE SOVEREIGN with MPK

A.PROCESSING TERMINALS - IN operate independently because of their (32 Kb minimum) microprocessors. Each can be used for supervisory functions, as a communications controller, or for the support of line or serial printers. Additionally users can create and run



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C. DATA ENTRY KEYSTATION PROCESSORS – there can be four of these, each supporting eight (520 character) Keystations on one system

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**EDITED BY PETER HEWITT** 

THE one thing that a calcuities, so the professional lating prodigy is not particuities, so the professional memory men electrify large larly good at is calculating. Yet audiences without in fact in a very precise and well having any better or worse raw documented sense, that is the memory than the next man. fact of the matter.

about the nature of highly is actually storing and addres-trained intellectual skill, which sing each atomic item, just as seems a little obvious once it is stated, namely that if you are obliged to operate on problems bit RAM inside his skull.

Larry Lorayne in his "How obliged to operate on problems with a computer made of jelly, to develop a super-power you are likely to develop rather computational

Facts such as the one cited study his mnemonic rules, or above seem to administer a jolt any similar mnemonics. Such nonetheless. People forever rules centre round the systeslip back into the assumption matic formation of associathat the brain's raw bit- tions for pairwise linking of handling capacities, in the case concepts, coupled with the use at least of sufficiently gifted of imagined sequences of and trained practitioners, are events, ie stories. This latter the equal of at least an 80 mips was regularly exploited by an-Cray-1 machine. I call this the "van Dusen delusion", after the hero-detective of the early

The textbooks on rhetoric the hero-detective of the early French thrillers of Jacques

"Bloody Murder") Julian house and courtyard for Symons tells us the following: "He (Professor Augustus S. F. X. Van Dusen) is introduced to us

when he refers contemptatously to chess, saying that a thorough wledge of the rules of logic is all that is necessary to become a master at the game, and that he could take a few hours of com-petent instruction and defeat a man who has devoted his life to it. A game is arranged between the Professor and the world champion, Tschalkowsky. After a morning spent with an Ameri-con chess master in learning the moves, the Professor plays the game. At the fifth move Tschal-kowsky stops smiling, and after the fourteenth, when Van Dusen says 'Mate in fifteen moves, the Dieu!' (he is not one of those Russians who knows no language but his own), and adds: 'You are not a man; you are a brain -

a machine - a thinking To calculate a mate in fifteen someone speaks fairly slowly knowing nothing but the the following number to me moves would occupy the with the idea that I should later Cray-I for something like 1030 recall it: "803, 735, 204: 381. years of continuous running, 692". The memory-man's The age of the solar system is approach is to put together a but a flash by comparison, a rapid mental scenario as the mere 1016 years or so, so that it digits are spoken, something is hard not to feel sympathy like this, say: "I have a date with Tschaikowsky. Had he with an all-in Wrestler but she known more physics Tschai- gets up into a tree thinking to kowsky would have realised that the great detective's per- of the tree onto a bee-hive getformance was not just super- ting bees into her shoe which human but actually super- sting so that she breaks the natural, since limitations to do high-jump record through the with the speed of light and the door of a passing plane which atomic dimensions of matter crashes on the tree so I have decree that NO machine could my date again and start with a ever perform the feat which he bun for the two of us with had witnessed, not even a Weetable and wine which she "thinking machine"!

Although the van Dusen de- the bees so all end happy." lusion is at its more rampant in the matter of processing ised story is violent, childish power, the aniooker tends to endow the expert's brain with otherwise embarrassing will calculate any faster than you was that fifteen-digit number?" "Would it have been not analyse numbers of moves 803, 735, 204, 381, 692?" I will in the forward tree of possibil- reply innocently, as my inner

Somehow the audience con-There is a general truth vinces itself that the performer though he had some vast 1010

> memory" opines that anyone can acquire the same gift just by working hard enough to cient Greek orators for lear-

advised reading through the speech while perambulating Reviewing one of these (in accustomed terrain, one's example. Each time the speech was conned the same journey would be made, until each sentence was tagged by association with a familiar

> When finally launched on the speech the orator needsonly imagine himself sauntering over the route, and as in his mind's eye he passes each familiar sight, the corresponding passage of text is triggered from memory. Ridiculous, weird, obscene,

violent and generally far-out

images make the best associations. Suppose that my private numbers is "Nought is for shoe; three is a tree; four is a door; five is a hive; six is Weetabix; seven is Heaven; eight is a date: nine is for wine" and make it to heaven, but falls out

pours into her shoe drowning The fact that the extemporbad-taste, grotesque and

eye follows that muscle-bound lady through her appalling

To mention a few tricks of the trade is only to graze superficially the deeply worked territory of the memory men. But the principle is not in doubt. Their amazing achievements, just as those of a Grandmaster in remem bering chess games of his own and others, are not attributable to the Creator's having handed them some special piece ( hardware. Prima facie tests o a Grandmaster's power to recall briefly-glimpsed chess positions seem, it is true. to indicate possession of special equipment. But try randomly permuting the pieces on the board before the brief glimpse. Robbed of the meaningful associations with which, for him, a chess position overflows, the gift promptly deserts

So too with calculating pro digies, of whom the greatest was probably the late Professor Alexander Aitken, the Edinburgh mathematician. In his published study of Aitken Professor lan Hunter remarks

"a number is apprehended (by Altken) as a multiplicity of numerical attributes and, so to speak, as bristling with signal-ling properties... This simult aneous, immediate apprehen ding of numerical attributes in often autonomous in that no specific preparation is necessary. For example, on one occasion the thinker heard the year 1981 this as 37 times 53, and 4 squared plus 5 squared, and 4 squared plus 19 squared."

This power to apprehend attributes in a flash reminiscent of a Grandmaster's glimpse of a chess position, was the basis of what Hunter called the "First phase". Aitken's response to a problem was divided into two phases. During the first he was through his well stocked pattern-memory for components with which to syn thesise a calculative plan During phase 2, or "run time" as we might say, he was executing the plan by doing the specified calculations in sequence. But the sequence proceeded, as measured by the cessive digits of the solution, at roughly the same speed at which anyone else would have

So calculation itself is not where the calculating prodigy's genius lies. Program thesis, not the program, the heart of the matter

Reference. Hunter, I.M.L. (1982) An exceptional talent for calculative thinking. Brit. J. Psychol. 53,



BP buys package for Jackson method

supports the Michael Jackson structured programming method has come into the limelight with the sale of the package to BP. And Michael Jackson Systems is preparing to sisted of a list of operations cularly those concerned with market the software more

JSP-Cobol generates a Cobol procedure division directly from Michael Jackson's design language. It was installed by BP late last year on trial at its Harlow site, and has now been bought for use on its Univac computers.

A spokesman for Michael Jackson Systems said the package had been in existence for about two years. It had seven or eight users, the longest standing being International Stores.

ware left the first three divisions design method," the spokeson of a Cobol program unchanged, observed. he said. However, the procedure division was radically different pre-processor input here contogether with design language saving space. For example specifications of the processing where several SELECT option structures.

The pre-processor, he said, software would generate a conshould not be regarded as a way mon action-tall, branched its of generating Cobol more with GO TOs. quickly. Rather the input should be treated as a higher level itself, the package includes partial language in its own right. Maintenance, for example, should be performed on the design language, not on the Cobol. IBM VS, OS, and DOS system "If people are going to mess A version for ICL 2903/4 s.

shared the same end-action to

Mostly written in JSP-Cobs around with the generated tems is expected to be available

sion to convert to TPS \*L

Ellerman Lines' need to intil

system. Telecomputing's law active Operator (Software fe-

October 13, 1977) coulder: 4

to TPS with only a slid &

A spokesman for Ite:

Hermes regretted that be ?

pany had not been sid!

examine the projected Worth

load. "One question is viril

the plans are feasible under

"Assuming that they i

there are many approached

improving system performar.

for example tuning the mesage

ternational Urban Technologi

LGORU acquired UK and Ent

Exchange Program.

TP system

### Why Ellerman replaced proprietary TP monitor after two years

systems philosophy are cited by llerman Lines, the shipping firm, as the immediate reason for its decision to replace a proyears after first installing it. At the heart of the problem is

advocated by the company for use under MTS on its small 2904 mainframes. Ellerman Lines two years ago bought two 2904s, which serve three remote sites through a 7502 controller. At the same time it bought Zeus Hermes' Cortez

cipated high-volume TP appli-Low-volume inquiry routines were to be implemented as stand-alone programs under

TP monitor, to support anti-

However with four such programs implemented, the company found that the query response time varied unpredictably when batch work was running, rising on occasion to as much as a minute. This was attributed to

the roll-on-roll-out overhead. The only way to achieve a predictable response time was to lock the inquiry programs in store. With a total of eight inquiry programs projected, this approach was ruled out because of the cost of buying the extra

Instead, the firm decided to adopt a single program approach, using overlays, while at the same time installing Telecomputing's TPS. A major factor was the performance

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field of application from computer listing, through

improvement possible using a that another factor in the decimulti-threading TP monitor.

"Having decided to change our approach, and taking into an online program developme account our projected workload, performance was the critical factor," said a spokesman. "We wanted to put out TP on the the roll-in/roll-out mechanism most efficient basis possible.

"We found Cortez an excellent environment for developing TP upplications. The version we have however is not multithreading and I don't regard the enhanced software, Cortez-Plus, as a true multi-threading moni-

"It is actually a multi-leaving system, permitting tasks to be interrupted. Moreover, these facilities have to be built into the application, and are not handled router. I am sure we could have automatically by the monitor." sorted out the problems give The spokesman explained the chance.

Councils to use US vehicle fleet management system A US-developed vehicle fleet Technology Inc. one

management system has been LGORU's partners in the f acquired by the Local Government Operational Research Unit, LGORU, for future use by local authorities in the UK. The software may also be sold to other ICL mainframe users.

Called Fleet Management Package, the software serves the needs of transport and workshop managers for information maintenance.
It was developed by Public

rirst user of the system

Northumberland Count

cil, which will implement

existing IBM version.

marketing rights to the softman after investigation revealed to no similar package was re-rently available, it has enter, an agreement with ici or sales to ICL users.

First user of the system

# Chance to find out what APL can provide

rearing to be new in London this Friday, November 10. Due to speak is A! Rose, one of the world's formost exponents of the langu-

Rose, one of the founders of the Scientific Timesharing Corp., will give his one-day "Introduction to APL" in the Reed Lecture Theatre et Imperial College.

The same venue has been

"THE simplest, most effective, and most enjoyable way to find out what APL can offer" is how the APL User Group describes a APL User Group describes a meeting to be held in London this meeting to be held in London this find the Alexander 17 on APL and the speak on November 17 on APL and the speak on the speak of the speak o tion just one week later by lan Sharp, head of the other major APL timesharing company, I. P. Sharp Associates. Sharp will speak on November 17 on APL, communications, and the development of APL

over the next ten years. Those wishing to attend on either day should contact Peter Cyriax at ICL Dataskii (Reading 583696) or Mik Goodali at Ciba-Geigy (Horaham 50101). The UK APL User Group is a specialist group of the British Computer Society.

### PROGRAMMER NOTES

### Shortage of expertise threat to growth of electronics

and carving ivory statues than

These are the colourful analogies used by an American electronics expert while addressing the Electronic Industries Association of Japan in Tokyo last month.

Earle Jones, of SRI International (formerly Stanford Research Institute), was seeking to explain that shortage of software expertise could limit the growth of electronics in the 80s more than any other single

His statement on programming is neatly echoed in the opening sections of a recently published book, "Etudes for arely aimed at developing programming skills. craftsmen" programmers.

Essentially a collection of programming exercises, it is intended primarily as a source book for programming course

The problems, which are sizeable, are placed by the author in the context of the classic apprenticeship. "They are suitble," he says, "as training projects for the novice programmer who wishes to become first a journeyman and then a master."

"PROGRAMMING is a craft. He disclaims, however, any more akin to weaving baskets attempt to teach specific prostructures, or languages. The book also avoids discussing any particular programming style or structured programming

> Of the 28 problems presented, many arise from the two areas of games and computer science, and although only two full solutions are given, a bibliography is provided which will often suggest an approach.

An original idea, it has been turned into a clear, inviting, and nformative text by its author. who teaches at the David campus of the University of California. It will be found both enjoyable and instructive by Programmers", which is anyone keen to extend their

\*Etudes for Programmers, by Charles Wetherell, pp.200, published by Prentice-Hall, £9.05.

#### Correction

A TYPOGRAPHICAL error occurred at a key point in Jon Kerridge's article on microcode (Software Techniques, CW, October 26). The second paragraph on p.34 should have begun with the sentence: "In the same way that a program is a sequence of instructions, a microprogram is a sequence of micro-instructions."

# IBM's System 38 offers exciting innovations

ably the most exciting innovation in IBM's newly-announced System 38 (CW, October 26) but the package offers in addition a host of other software enhancements over the much smaller System 34.

One of these is the introduction of what IBM terms a "single level storage concept," under which programs, data files, and system command files are all reated as equivalent "objects" by the storage system.

This is combined with a system of dynamic memory management which automatically optimises resource utilisation under multi-programming operation. It was described as a new style of virtual storage" by one of the first to examine the software, Rona Bassett, of

Osprey Computing Services.
The DBMS, she noted, was

essentially relational in type. It consisted of a "logical file" structure which, overlaid on the physical database files, allowed the DBMS itself to build access paths automatically.

Items in the database are accessed via a data dictionary, which defines the field name. length, and physical file in which the item occurs. Logical files may thus be defined consisting of data items from several physical files.

Changes in the physical file lay-outs, such as the addition of new fields, have no impact on existing programs. The logical file approach

allows System 38 to dispense entirely with sorting routines. Based on the logical file definition, an access path will be constructed by the system to present items in the order required. "The access paths are prob-

files, which are updated when a new record occurrence is added," noted Ms Bassett. "As evidence for this, around 30 Mbytes of each disc is required Mbytes in the case of System

"All this means that it will be more important than ever to design files properly, with the right data at the right level. You really want to have all indexes for all the physical files."

RPG III, the only language for which support has yet been announced, is significantly more procedural than RPG II, but will compile programs written in the older language. New constructions introduced

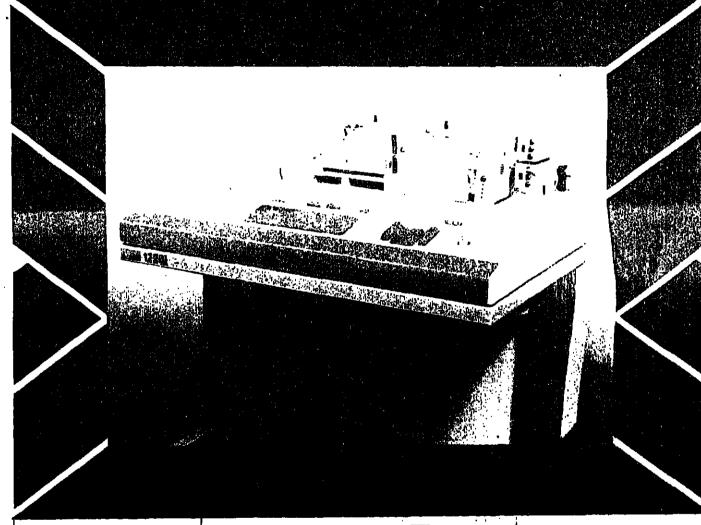
include DO . . . WHILE and DO

The system provides all the supported on System 34, adding These enable users to examine by System 38, as opposed to 4 and change data values during execution and then restart the

program.
Also provided is a useful testing mode, under which the system automatically takes copies of the live files needed for tes-

The Data File Utility has been enhanced "out of sight," according to Ms Bassett, and there is a new utility called Query which provides an interactive reporting mechanism for end users.

The only thing missing, concluded Ms Bassett, "is the Summary Sort feature. This was UNTIL, and the language very useful on System 34, but also features a new branch and with no Sort on System 38, it compare. In addition there are obviously can't be supported."



# 

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data stores (RAM)

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To distribute this extra duty necessary for three people on one of the 38 possible pairs of

Can you formulate a suitable

roster? Answer on page 61,

programmers is required to work on one evening, and one

hanks to proven ele advanced mechanical design, the Varian 9000 Series delivers consist ently superior graphics with minimum operator attention.



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# A package for program function keys under DOS

PROGRAM function keys, which often save IBM OS/VS operators much unnecessary typing (Op Spot, CW August 17), may be used to similar effect in the DOS and DOS/VS environ-

The software package which makes this possible is called Logout and is available from Macro 4, a software house in Wallington, Surrey.

This piece of information will be of particular interest to the shift leader who contacted me a while back to discuss PFKs in relation to his system, an IBM 370/138, under DOS/VS, Release 34.

In a letter to Op Spot Keith Piper, a programmer at Macro 4, Piper

standard, unmodified, DOS/VS trol, attention routine or any supervisor and does not entail other IBM supplied component.



\*Logout operates with any renaming or changing job con-

fined at IPL, or load, time and may not be modified online.

Continues Piper, "Logout will display the text associated with each key but, quite deliberately, does not allow the text to be altered. After some discussion. we decided that setting the values at IPL time gave the flexibility needed, without the risk of accidental alteration."

Each key may be assigned up to 30 characters and the text odified before submission. Says Piper, "The text may

represent a complete input message or just a prefix to a message. Since Logout PFK support operates by adding the text to the beginning of any input typed by the operator, the concepts are identical." He gives the following explanation:

"The user includes these

PF6='D RDR,',PF12=MSG

"Now to enter D RDR,FREE (a commonly used POWER/VS command) the operator types FREE and hits PF6.

'The attention routine displays 'D RDR,FREE' and processes the command as required.
To enter 'MSG F2', he simply

Other features include: Timestamping each message on the log (in a Virtual Machine environment the CPU-ID is in-

Message suppression, which writes unwanted messages to the hardcopy file, but omits them from the log itself.

Reprint and analysis programs for the hardcopy file.

HINT OF THE WEEK

### Check all job control cards yourself

ards submitted) into the card reader, scan the deck for any errors in job control syntax. In this way it might be possible to pre-vent the job being flushed by the system as the result of an error. Thirdly, by examining on decks in this manner the open will become adept in speni Now some might contend that it is the responsibility of the job

control section to check the cards in this manner but, to me, that is a Queueing listfiles on same printer

THE George 3 operating system will sometimes offer a number of alternative solutions to an had a PROPERTY of operations problem, providing staff are willing to make use of its facilities and employ their own technical expertise.

I say this after considering some comments from Geoff Westcott, a programmer and former senior operator. He writes to Op Spot in response to a letter from Roy Cosway, senior systems programmer at the Truro site of Cornwall County Council (Op Spot, CW October

munication between operations and programming, and gave unexample of what this can achieve. He described a situation in which George 3 intends to print payslips on two printers, simultaneously, but the operators want only one unit to be used for that purpose

He went on to explain how the system programmers, once they knew about the problem, were able to make a small change to the operating system and save the operators a lot of typing at

Now Westcott feels that PERTY may also make use altering the operating system is the printer to which it attributed."

ONELP, which was set u: PERMANENT, INCLUSIVE

Firstly, a lot of time is wer

the job to the system, snywy.

1) PR ONELP (PERM, INCI) AU 14. PRONES

good effect when it is necess. to list more than one flu special stationery, using just printer. He gives an eram;

1) LF PAYI, \*LP,PRPAISE & ONELP

Says Westcott, kn/5

only one of the primited PROPERTY attributed I both listfiles will be que! the same printer and pe request to load payslips

Pointing to the reason specifying INCLUSIVE he

As a DP manager, you're

probably more aware than most of

On the one hand, your system

the great computer paradox.

is designed to cope with vast

quantities of work, and to save

But on the other hand,

there's you. Overworked.

time for innovation.

updating and modifying old

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The System/38 works with a

people time.

## Where do I go from here?

IN the absence of established career paths for operations cause certain enlightents people, more and more staff are stallations are aware of the becoming aware of the need to use their own initiative to secure positions where they can make use of their hard-won skills.

In this regard a senior opera-tor from Staffordshire writes, "I have five years' operations experience in a large real time environment. I am looking to further my career but do not want to move out of opera-

Apparently he has seen an advertisement for an operations analyst, and asks, "Do you have any information about this kind of position? The only requirement specified was that the

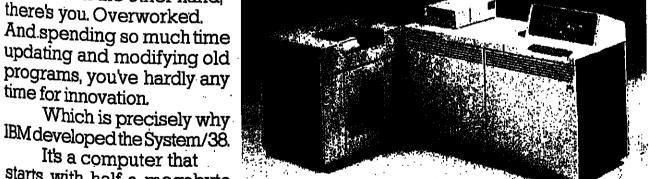
perience and technical exthat operations staff has

Now most support told for a thorough understand hardware or software or In this instance the need "strong personality" is significantly which implies that one significant the work will involve tigating errors and the

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Its extensive in-built security

features help each department keep its own data secure, yet allow them to recall it in any form whenever it's

System/38 is so simple to use that everyone with any responsibility can be trained to use it. because the virtual storage approach

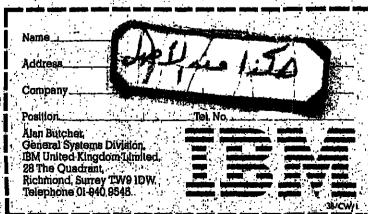
In fact, it can help in experienced users with prompts.

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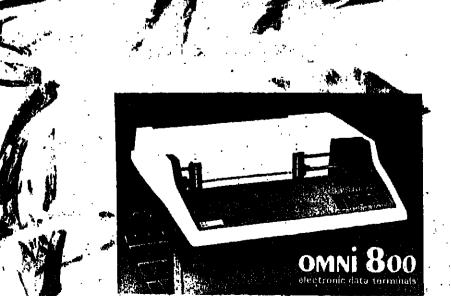
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# Shift Supervisors

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### Woman appointed director of NCR

A MATHS professor at New York University, Cathleen Morawetz, has been appointed to the board of Mathematics chairman of the Comtors of NCR in the US.

Research Council's Advisory Board to the Office of Mathematic Sciences and of the US National Science Foundation's Advisory Panel for

Mathematical Sciences. Olivetti UK chairman

At present he is vice-chairman of Manufacturers Hanover, of Credito Commerciale Italiano and of EFI

A NEW chairman has been appointed at British Olivetti. He is Ettore Loili, who earlier this year was appointed to the main board of the Italian Olivetti parent company. Loili spent some years in the US, with American Gas and Electric Service Co, and as chief of the Italian Technical Delegation in Washington. He then became a director of the Banca Nazionale del Lavoro, and in Banca Nazionale del Lavoro, and in 1963 was appointed the Group's de-

puty director general in Rome. He has served as chief executive and as chairman of Riunione Adriatica di Sicurtà and of Assicu-

Fritz Trapnell has been made vice-president, software, at Amdahl's US headquarters. Previously he was manager of retail market planning and development at

Paul Draper, senior consultant at RTZ Computer Systems, has returned to the company's Bristol office after a year's secondment as DP manager to RTZ's mining plant. Glynla Prosser, who has joined RTZ as a systems analyst from Dorset County Council, has been seconded

A Canadian by birth, Dr Morawetz is a member of the US National and chairman of the curriculum committee of Princeton University's board of trustees.

Banca, and a director of Euromobilare in London and of the

British Reserve Insurance Company,

as well as of several other com-

panies in finance and insurance in

He replaces, as chairman of British
Olivetti, Glovanni Fel, who has gone
to Japan to become managing director of the Japanese Olivetti, Luciano

Cohen, who was formerly MD of the Japanese operation, returns to Italy

to take another post with the parent

to Rossing to work on a team of

three who are developing accounting and management systems.

Barry Carrington, recently appointed head of AMI Microsys-

tems' manufacturing group, has been made vice-president of manufacturing based in California.

Victor Levine has left UCSL, where he was business development manager, to go freelance as a plan-

venture consultant, primarily to

Europe and thé US.

William Shiffke has been appointed special systems software engineering consultant with Systems's R&D dept software development group. His previous post was on the academic research staff of UMIST; where he had project responsibility for the implementation of some real time systems and was also researching for his PhD on computer-based image pattern recognition techniques. Dr Morawetz is also a trustee, member of the council and member

Four more staff have been spointed within the same group at Systime. They are senior software engineer Alan Scott, previously an analyst/programmer with Digital Equipment Scotland; and software engineers Les Wilson from Associated Weavers, John Elilott from Hawker Siddeley, and John er from CSS. Appointed personnel manager

Microprocessors. Dr K. G. Pearson. Institution of Mechanical Engineers Applied Mechanics Group. IMechE. 1 Birdcage Walk, London SWI. 17.30.

NOVEMBER 14
Real time operating systems and languages, lunchtime workshop. Digital Equipment. James Watt House, Tottenham Court Road, London WI. 12.00.
Computers and privacy. Sir Norman Lindop. IEE. Savoy Piace, London WC2.
Recent developments in computer security. Dr J. Horsey. BCS Croydon branch. Psirfield Hells, Croydon. 19.15.
Structured programming. Ian Scougall.
BCS Harlow aub-branch. Harlow Technical College. 19.30.

DIARY

William Shiffke has been with Systime is Ron Napier, formerly personnel executive with Plessey

THE decision on the scanner to be

### Scanner decision

Music in Europe with IBM

THE European Community Youth Orchestra is to be sponsored by IBM for its 1979 tour of Europe.

The orchestra will play in the nine EEC capitals, beginning in Italy on August 8, and will also play at Strasbourg in June, during the celebrations for the direct elections to Europe.

Preliminary British auditions will be held in London on December 1-2, Cardiff on December 3, Manchester on December 4, Glasgow on December 5 and Belfast on December 6.

bought by Manchester's Christie Hospital and Holt Radium Institute with the money raised by Mrs Pat Seed's fund (People and Events, mber 2) has now been made An EMI 7070 whole body scanner

is to be bought, together with an Emiplan 7000 system, which uses the scan images to plan radiotherapy treatment according to patients' in-The building to house the machines should be ready by August 1979, and it is hoped that preliminary

testing will be over and the first

patients scanned in early autumn.

**NOVEMBER 14-18** 

NOVEMBER 15

NOVEMBER 16

lotel, Gulldford, 19.30.

NOVEMBER 19-22

NOVEMBER 20

Computerised auditing, a US perspec-tive, Donald Adams, BCS London branch, Waldorf Hotel, London WC2, 18,00, Computer-generated art and music, J, Lansdown, BCS Guildford branch, Stoke

Hotel, Guildford. 19.30.
Programming languagos, Coral 86,
Pascal, RTL/2. J. Fisher, M. Jackson, John
Smart. BCS W. Herts branch. Heath Park
Hotel, Hennel Hempstead. 19.30.
Impact of Information systems on organisational thinking. Bob Tricker, BCS
Oxford sub-branch. Europa Motor Lodge
Hotel, Oxford. 19.45,
Student evening. BCS Coventry
branch. Lanchester Polytechnic, Rugby.
19.30.

Computer simulation and psycholinguistics. Dr G. Cohen. Computation/Linguistics, University of Oxford. Dept of Experimental Psychology, South Parks Road, Oxford, 17.00. Details: Mrs S. M. Hockey, tel: 0865 50721.

Micro II. IEEE Computer Society.

Computer languages, the way ahead. Tony Hoare. BCS Nottingham branch. Chamistry Bldg, Nottingham University. 19.15.

president of manufacturing with Dataproducts in the US. He is replaced as vice-president of the critical components group by John DeSantis, previously director of Ken Coulter has become manager

of international field marketing operations with Redifon Computers. He was formerly product marketing Also at Redifon, David Laurie has been appointed branch manager.

Basil Saunders has been appointed director-general of Asilb, the Association of Special Libraries and Information Bureaux. He succeeds Leslie Wilson, who has retired after 28 years as director.

### Recruitment in the North-East

A COMPUTER recruitment or pany based in and serving North-East of England bask formed and will be run by he Moodle.

A former ICL systems engramondie was recently a letter.

Moodie was recently a letter, computer studies at Sundent Polytechnic. Rosalind Snale, viously with Rank Xeros, has ke the new company as smaller. the new company as senior per nel consultant.

Northumbrian Compy.

Manager is at Northgate Houe!

Mary's Place East, Newcaster!

Tyne, tel: Newcastle 2842!

George Bannerman has been moted at Compower from de MD to managing director, He ceeds Bob Hitchcock who have appointed managing directord: Ancillaries. Frank Northen comes marketing manager national accounts; he was profe. a senior consultant for a accounts. He succeeds Erk The who has become general many

The Liveware Sage ha page 11

# ALTHOUGH the quality of

Scicon looks

for experienced

Edited by Nancy Pocos Honeywell Level 61/62

ALTHOUGH the quality of today's university graduates has led Scicon to recruit a growing proportion of its new staff from higher education establish ments (CW, October 26), the company continues to recruit experienced people very actively. In the last 12 months, Scicon took on 113 new people, of whom 59 were recruited from the industry and 54 directly from university.

"These figures demonstrate that in addition to our recruit ment of high-class graduates we are actively recruiting experienced staff," Ray Walte central marketing manager at Scicon told Computer Weekly. "Experienced staff are crucial to the continuing growth of the company," he added.

The aids can convert transaction-oriented programs written in Cobol and Level 61

conversion aids now

available worldwide

machine

Some of the first users of the aid will be in the UK, because

Honeywell UK is not prepared to

supply a customer with the more

powerful version of the 61/60-2,

If he needs to expand his sys-

tem's capacity; so he is obliged

to upgrade to a Level 62

There have been complaints

about this policy centred mainly

on anticipated costs of conver-

ting programs to run on Level

62, and other factors like the

cost of the air conditioning ne-

eded with a Level 62 machine

(CW, August 17), following

which Honeywell executives

addressed a meeting of the UK

They pointed out that the air

conditioning for a Level 62

machine should cost no more

than about £3,500, and discussed

the conversion aids that are now available free of charge.

Level 61 users' group,

loads are growing and they want

There are only about 60 Level

61/60 users in the UK, but CH-

HB has something like 5,000

Software aids for converting

programs from the 61/58 small

batch machine to run on Level

62 have been available for some

Services for Level 61 and 62

users are now being offered by a

new company, Eurodynamics,

based at St Albans, Herts. The

company has already developed

munications software packages

for the Level 62, called

Commplus and Combat.

and implemented two com-

Level 61 customers worldwide.

to stay with Honeywell.

### Xerox to buy Calcomp memory products division

THE MEMORY PRODUCTS lines of OEM disc drives, but DIVISION OF Calcomp, put up for sale last month (CW, October 5), is to be bought by Xerox for about \$25 million in

The agreement covers the manufacturing plant near Cal-comp's Anaheim, Callfornia Chinose dogation headquarters, and involves the Indent, Hunter and Marksman

# \$4.2m damages foundry production contains tem developed for a Digico minit by BNF Metals Technology

claimed he had been lured on to the company's staff by promises of a high managerial post that were never fulfilled.

lives in Brussels, charged that he been told he would be in charge of the company's new transpor-tation division. Instead he worked as a manager in the

excludes Calcomp's floppy disc drive line. Calcomp will also continue to

buy in IBM-compatible disc and cash, subject to approval by tape units and add-in memory

KEEN interest in UK computing technology, including a brass foundry production control systo ex-CDC man Centre in Wantage, Oxiotosania was shown to delegates from the Chinese Academy of Sciences DAMAGES totalling \$4.2 million

Chinese Academy of Sciences which visted the UK earlier this have been awarded to an month to examine the way Australian-born former research work is transferred to industry.

Edward Wrathal, who now THE first firm to use a direct link-up from the US to an outleft a job at 1BM and joined side company using the Americantrol Data in 1973 having been told be usually by the company using the American Satellite Corporation's deficiency of the company using the American Satellite Data office-to-office Satellite Data Exchange service, which uses intelsat Earth stations, will be Texas Instruments, which plans



### A SET of software aids for converting Honeywell Level 61/60 programs to run on Level 62 systems is now available to 61/60 users all over the world. The aids were developed jointly by the Honeywell technical centre at Pregnana, near Milan, and the company's system centre at Hemel Hempstead in MiniCohol to Level 62 Ansi 74 Cobol and should be of interest to most Level 61/60 users because an upgrade to Level 62 is almost inevitable if their work-

### Fawlty decisions?

HOLLYWOOD, here we come! A Digico M16E minicomputer is of Fawity Towers fame, in another of his light-hearted business training films. Called "Decisions, Decisions", the film depicts Clease as a clueless manager attempting to organise an office-moving, including a

make, and how not to make, de cisions in business, emphasising the importance of consultation. Cleese (who is sided and abetted in the film by Prunella Scales) is rescued from his bumbling by rescued from his bumbling by figures from the past, Brutus, Elizabeth I, Churchill and Montmulti-terminal Digico system gomery, who show him how which he tries to pack into tes made their great decisions. gomery, who show him how they

### **New disc** technology from IBM

named Whitney, is expected from IBM soon. It is believed to use thin-film recording head technology and is part of disc technology research being car-ried out by at IBM's plant in San Jose, California.

The new disc technology is

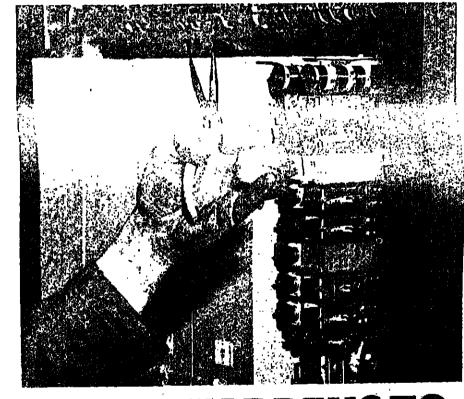
believed to involve the use of ultra-smooth ceramics, possibly over the traditional luminum alloy platter but conceivably with a new material used for the entire medium. The ceramics is coated with a fine-grain recording medium deposited via new coating techniques.

By limiting the depth of the coating, it is understood that very dense data recording is made possible, as is very high speed disc motion.

#### Ford dealer

As part of a £650,000 expansion plan, J. Blake, a major Ford dealer, has ordered an ICL 2903/40 to be located at its

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Development in distribution switch-gear, conference. IEE/IEEE/IMA. Savoy Place, London WC2. Register with IEE, 01-240 1871.

SERIES IV — the medium by which operators and NOVEMBER 21

Portable communication systems, colloquium, IERE, Royal Institution, London W1, 10,00, Registration necessary, phone 01-383,3071, ext. 16.

Formal specification of organisations.

R. Stamper. BCS Formal Aspects of Computing Science Group. Polytechnic of Central London, London W1. 18.30.

How decisions get made in managing projects, seminar. Association of Project Managers, Waldorf Hotel, London WC2. 10.00. Details APM, 01-789 3182.

Newspaper survival, past, present and the electronic challenge. I. Lindsay-Smith. IEE. Savoy Place, London WC2. 17.00. Microprocessors, IEE, King Edward Grammar School, Chelmsford, Essex, 18.09.

Array processing. M. Bayliss. BCS Chellenham & Glos branch. Gala Club, Fairmile Gdns, Gloucester. 19.30:
The role of large computers in the 1980s. Prof Frank Sumher. BCS N Staffs branch: Post House Hotel. Newcastie-under.

Word processing, BCS Aberdeen branch, College of Commerce, Aberdeen.

Flight simulation and other systems. Mike Grant, BCS Reading branch. Small Physics Lecture Theatre, University of Reading, 20.00.

Career prospects in the computer services industry. Alan Benjamin. BCS S Wales branch. Bear Hotel, Cowbridge, 18.00. NOVEMBER 21-22

NOVEMBER 14-18
Mezura 78 (testing, measurement, automation), interbiuro 78 (office equipment and DP) exhibitions, and international seminar week. Management of the international Poznan Fair. Poznan, Poland. Details from IEG Industrie-Export-Interessen GmbH, D-5850 Solingen/BRD, POD 100 410. Database management systems and information retrieval. Elizabeth Burraclough, Prof Peter King, BCS Information Retrieval Group/Asilb Informatics Group. City University, London ECI.

Visit to Ford Motor Co. BCS Hampshire branch. Swaythling, Southampton. 14.00. Information engineering and electronics. F. J. M. Laver. IEE/IERE. St Mary's College, Choitenham. 19.00. Databases. 1. Draffan. BCS Tecswire branch. Toesside Polytechnic, Middlesbrough. 19.00.
Programming languages 1. Dr J. Lar. Cobol enhancement for the 808. J. C. Piggott. BCS Cobol Group. BCS HQ. London W1. 14.15.

VIS-NEWS, DPM. VISINEWS, Cumber-land Avenue, London NW10, 18.00. Visit to American Express. BCS Sussex branch, Brighton. 19.30. How to produce an operating system, perhaps. M. Wright. Dept of Computer Studies. Heriot House, Sheffield City Polytechnic, 14.00. Polytechnic. 14.00. Software for the small machine, R. R. Waller, BCS Belfast branch, Wellington Park Hotel, Belfast, 20.00.

Structured systems development and quality control sentinar. John Parker. BCS London branch. London SW7. Register: Christine Moulang 01-637 0471.

NOVEMBER 22-23 Visit to Ford Motor Co. BCS Hampshire

Programming languages 1. Dr J. Larmouth, J. Lucking, Polytechnic of Wales, BCS 5 Wales branch. Polytechnic of Wales, Treferest, 14.15. Details (0443) 405133.

Electronic funds transfer, the role of

Visit to Manchester Computer Workshop, BCS Manchester branch, Hanging Ditch, Manchester, 10.00, Numbers imited, contact R. Baker, 001-928 5471.

NOVEMBER 22

Database menagement spirar.
information retrieval. Prof hur in
Elizabeth Barraclough BCS Ideas.
Retrieval Group/ Asilb Informatio
University, London ECI, 1408 lists
Maxine McCafferty, tel. 81-8849.

Local Authorities Groupset ( in Computer Users' Association is a Talbot Road, Streeford, Land

The Euronel telecoms of the Kelly, IERE, London School School Trupical Medicine, London (1914). An introduction to task (1914). puting. Dr P. Osmon. BCS (1914). branch. Howmoor House, Wed (1914). pital, Exeter. 1900. Online stock recording at Perlagines. British Production and Inst. Control Society, Royal Overseas La. London SW1, 18,45.

Bankers Automated Clearing Services, R. Hope-Smith, BCS Wolverhampton branch, The Polytechnic, Wolverhamp-

NOVEMBER 24
Semantic coherence as the bit-language of understanding Dr. Ru. Computation/Linguistics, bearras-Oxford, Dept of Experimental For-logy, South Parks Road, Oxford, Details: Mrs S. M. Hockey, ed 6537.

# Carried That Shot Alexander and the state of The kits&bits show

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Watch the Demonstrations in adjoining halfs—restronts project brought to life by the experts—and a charte for you to lay yourself the latest ideas from manufacturiers and identities. Competitions — Win a microprocessor kit — a frequency country of the kirls — and many other daily prizes through the show.

Seymour Hall Seymour Place London W 21-25 November 1973

transportation section of the to link its offices in Dallas, Texas computer group. Control Data is and Bedford in the UK with high contesting the verdict. speed data links. Liveware Saga WE WANT FIFTY CROWNS WHAT ON MIDDLE SHIFT ALLOWANCE! EARTH'S "SHIFT EITHER YOU GIVE US .. OR WE DON'T FIFTY CROWNS ... SHIFT THE BACKLOGI

terminals will be degraded by momentary

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Data Control Jacking

## RELATIONAL DATABASES

Part 3

## How fourth normal form files can be constructed

THIS week we will define fourth normal form files and show how

Relational Files. In conventional file design, one value of the key field (or fields) uniquely identifies one record. In files designed using relational database principles, each file has a key (or keys) which correspond to the more precise definitions given in Part 2. The following rules apply to such files:

Each key data item (or concatenation of data items) in a file has either an n-to-l or a l-to-l relationship with every non-key data Item in that file.

Each non-key data item in a file depends upon (each) key item. If a key is a concatenated key, each data item not within that key depends upon the whole key and not just part of the key. ● Each non-key data item in a file is not related to any other

non-key data item in that file. If a key is a concatenated key, each item within the key participates in an indirect relationship. The meaning of an indirect relationship is discussed later in this series.

Note again that a file may have more than one key and such keys may be concatenated keys. These rules can be summarised succinctly (If not entirely accurately) by the following aphorism: "Each non-key data item depends upon the key, the whole key, and nothing but the key."

Corollaries of the four rules are that in each file:

- There are no repeating groups.
   Each non-key data item depends upon the key or keys. If the key is a concatenated key, the non-key data item depends upon the entire key but not on any part of the key; no part of such a key is redundant. This is called "full" dependence and the key is called a "full" key. If there is more than one-concatenated key, each item within each key depends fully ioon each other key.
- 3. No data item depends upon a key via another (non-key) data
- 4. No data item which is part of a concatenated key is unrelated to any of the remaining data items in that key.

Normal Forms. A file which satisfies corollary I is said to be in first normal form. A file which satisfies corollaries 1 and 2 is said to be in second normal form. A file which satisfies corollaries 1, 2 and 3 is said to be in third normal form. A file which satisfies corollaries, 1, 2, 3 and 4 is said to be in fourth normal form.

Note that files in any of the normal forms may have only one

record type.

Direct and indirect keys. A non-key data item which satisfies corollary 3 is said to be directly dependent upon the key, and the

key is said to be a direct key for that data item. A data item which depends upon a key via one or more intermediary data items is said to be indirectly dependent upon.

thickey, and the key is called an indirect key for that data item.
Example: In the relationship diagram in Part 2, ORDER-NO is a direct key for CUSTOMER and an indirect key (via CUSTOMER)

Candidate keys. If a data item C depends upon a data item A and also upon another data item B (and if A and B are related), A and B are said to be candidate keys for C. Note that A and B do not merely form a concatenated key for C; either A or B alone is a key for C. A and B are in a l-to-l relationship.

Example: If Figure 1, Part 1, had an ITEM-CODE field as well as ITEM and each ITEM-CODE were unique to a particular ITEM, both ITEM and ITEM-CODE would be candidate keys for

Performance considerations apart, fourth normal form (FNF) files represent an ideal file structure, and the notion of candidate keys leads to a precise definition for such files. Since there may



## By Max **Stewart**

This is the third in a 10-part tutorial series on databases and structured file design, by Max Stewart, the divisional technical support manager for Leyland Vehicles. the commercial vehicle division of BL.

now be some confusion between the term "key" and "the key of a file", let us redefine the meanings of candidate key and FNF file as

A candidate key is a key (possibly a concatenated key) which is a direct full key for every other data item in a file. Each key value uniquely identifies a record within the file.

 A file is in fourth normal form if it has no repeating groups, i every direct full key is a candidate key, and if every concatenated candidate key contains an indirect relationship which includes all members of the key.

Creation of FNF files. The process now to be described can be used to create FNF files from a collection of data items after drawing the relationship diagram. Remember that in a relationship diagram a key is either on the 'n' (arrowed) side of an n-to-l relationship or on one side of a'l-to-l relationshi

Step 1. Select a data item which is a key (for data items which together form a concatenated key select all of them). The selected key (which may be a concatenation of data items) is called the prime key (strictly the prime candidate key). If two or more data items (or concatenations of items) are candidate keys, arbitrarily select one as the prime key. The remainder are called non-prime

Step 2. Select those other data items which depend directly and fully upon the prime key. This includes any non-prime candidate keys. If a non-key data item depends upon the key data item in more than one relationship (eg if in Figure 1, Part 1, there were two types of salesman - a "perishables" salesman and a "non-perishables" salesman — and a customer were allocated one salesman of each type), both data items can be considered to be available for selection as many times as there are relationships Step 3. Construct a file which has the prime key as key field and

has the selected dependent data items as non-key fields. Repeat these steps for each key (or concatenated key) which has not already been selected as a prime or non-prime key. Note that if an item is selected as part of a concatenated key, it is still available for selection later in its own right or as part of a

different concatenated key. After these steps have been completed, there may still be unselected data items. These can either be unrelated to any other item (in which case they form a file of their own - really just a list of values); or in an n-to-n relationship with one or more other data items. The following step should be applied to each pair of such data items in which each item in the pair is unrelated to any other unselected data item apart from its partner (ie is in the simple type of n-to-n relationship which was introduced in Part 2). More complex n-to-n relationships can exist but are unusual. Rules for dealing with them will be discussed in a later article.

Step 4. For each simple n-to-n pair, construct a file with the pair as concatenated key and with no other data items in the file. Finally, examine each file in turn and delete records which are

duplicated within any one file:
These steps look formidable in cold print but are simpler to rform than to explain. Remember that most of the time we are just picking out keys and clustering each key together with its:

ependent data items into a simple file.

Part 4 will include a demonstration of this process and will discuss some of th' vantages of FNF files.



# Managers and unions Microform come to grips with

computer data on to micro

forms (fiche and film) and its

work. The new microproces

VDUs (avoiding wet proces

sing) — these and many other

Computers" fits naturally law

the MSG activities. At this

entations chaired by Re

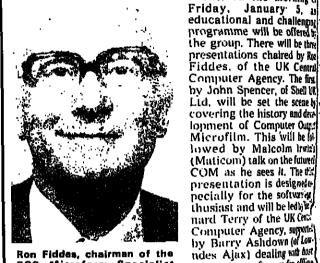
event, on the morning d

# Specialist Group the automated secretary

THE Microform Specialist more complex issues such as "holographic storage of workers — secretaries and type microfilm". The output of ists — directly, while data pro-Group, MSG, is a somewhat hybrid organisation supported by specialists from the computer and microfilm fields.

Some years ago the intro-duction of computer output (CIM), are highly active and in which the MSG sees some of a number of BCS members for more very worthwhile who felt that the potential of this new technology justified devices, the quest for an aller the type of closer study which able film to compete with a BCS Specialist Group makes

questions beckon us. BCS 79's theme. "Living wit In the first year of its life the MSG spent much of its time in the mutual education of



BCS Microform Specialist

Taylor (of Datagraphs European Division) will b microfilm and computer technologists and then set out to provide basic introductory talks to the public through

This basic approach to its the whole COM softwa activities has continued, scene. though nowadays early ques- In each of the presen tions such as "How does diazo time will be allowed for de film work" have given way to gates' questions

devices and Keith Borton NCR) will take a new look Frank Jones from Bradford City Council claimed to have saved £59,000 a year and cut typing staff from 44 to 22 with his Wordplex 7 system.

An added attraction was Barrie Sherman of ASTMS, there to give a "trade union perspective." "The unions don't have a view on word processing yet (because up to this year the TUC didn't know a silicon chip from a chip butty) but this doesn't excuse you from not having a view on

staff. So the human problems

involved in introducing it can be

formidable, and this was con-

firmed by the number of people,

more than 90, at Information

Studies' conference in London last week on "Word Processing

On the platform were several

well-known pioneers in the in-

troduction of word processing,

who came to describe their ex-

periences and give their advice.

- the Human Dimension."

the unions." he said. Things will start to happen soon, Sherman asserted, especially after next April's TUC rence on microelectronics. and as productivity is increased by word processors, more and more unions will be saying "we

(This led Logica's Pat Coen to remark with a grin that he was happy to take orders now from people wanting to get their sys-tems in before next April.) Sherman claimed that union

penetration in the clerical of the private sector, as yet very weak, would soon be growing to catch up with the public sector, and with government action on industrial democracy, this would bring about plenty of

duction of word processing.

sake let's get the 3 Rs right first

ference on the design of WP

equipment regarding ease of

use: the way cursors should

move on a screen, and so forth.

Loughborough University emphasised the importance of

adjustability of screens and

keyboards, and the tricky pro-

Gordon Ross, from the De-

partment of Industry's Work

Research Unit, raised the issue

that introduction of word pro-

cessing could cause problems

with career development struc-

tures. He also suggested that

work rotation could increase

satisfaction, in operating

blem of eyestrain.

printers and the like.

Tom Stewart, ergonomist from

processing is that it affects a goodly number of ordinary He was also scathing of the Prime Minister's notion that the service industries could absorb the unemployment caused by cessing has largely been done behind closed doors by specialist automation in manufacturing.

The principal product of the service industries is information. Sherman pointed out, and office automation would bring about plenty of unemployment there. There is no way," he said, "that a Birmingham typist can become a health worker in

Management was one of the key issues at the conference particularly the way in which yping services are organised. Shirley Pickard from ICI Plastics, and Irene Harford from Mussey-Ferguson, both de-scribed how their firms had got rid of large numbers of individual managers' secretaries and grouped them into "bureaux" of six or so each, sharing typing and other secre-tarial duties between them Many managers were reluctan to give up their "office wives," and central facilities had to be set up to handle such periphera jobs as tea-making that the secretaries hitherto had carried

Word processing screens were then installed in the secretarial bureaux, with generally good results. It was agreed by the speakers that word processors were not cost-effective when provided to individual secretaries, however attractive the machines might be, because that would entail expensive capital DORIS LENSON, consultant: For God's sake lot's get the 3 Rs right at school tirst, before teaching about word processing. equipment lying idle much of the time. It could be useful, however, to give them to managing directors' secretaries, in order to convince the MD of the value of

the concept. Pat Coen, as both supplier and user of WP, emphasised the advantages of shared-logic systems with regard to centralised management. Shared logic places under the direct control of the supervisor all purging of files, making of security copies, linking to other systems and other input media such as OCR, and so on. This, he claimed contributes greatly to productivity. However, he added changing the organisational structure at the same time as introducing WP could lead to trouble, as people could only

One cri de coeur that came from all the women on the panel was over the falling standards of spelling and grammar of the ypists now coming to them from school.

adapt themselves so much at a

Doris Lenson, who at the Automobile Association was a independent consultant, described how she set up training courses and daily spelling and grammar tests at the AA in order to fight this problem.

### **Prime developments** COMMUNICATIONS software ARC institutes to Rothamsite

for the Agricultural Research Council's Honeywell 716 frontend processors at Rothamstod Experimental Station will be de-300 now going through acceptveloped on a 195K byte Prime ance tests. The Prime 300 has an associated with its particular instruction set similar to the 716s, which are dedicated to controlling links from about 20 associated with plans to us in EPSS and its plans to us as well as new facilities to as well as new facilities to a set of the controlling links from about 20 leased line and dial-upus to the plans to us as well as new facilities to the controlling links from about 20 leased line and dial-upus to the controlling links from about 20 leased line and dial-upus to the controlling links from about 20 leased line and dial-upus to the controlling links from about 20 leased line and dial-upus to the controlling links from about 20 leased line and dial-upus to the controlling links from about 20 leased line and dial-upus to the controlling links from about 20 leased line and dial-upus to the controlling links from about 20 leased line and dial-upus to the controlling links from about 20 leased line and dial-upus to the controlling links from about 20 leased line and dial-upus to the controlling links from about 20 leased line and dial-upus to the controlling links from about 20 leased line and dial-upus to the controlling links from about 20 leased line and dial-upus to the controlling links from about 20 leased line and dial-upus to the controlling links from about 20 leased line and dial-upus to the controlling links from about 20 leased line and dial-upus to the controlling links from about 20 leased line and dial-upus to the controlling links from about 20 leased line and dial-upus to the controlling links from about 20 leased line and dial-upus to the controlling links from about 20 leased line and dial-upus to the controlling links from about 20 leased line and dial-upus to the controlling links from about 20 leased line and dial-upus to the controlling links from about 20 leased line and dial-upus to the controlling links from about 20 leased line and dial-upus to the controlling links from about 20 leased line and dial-upus to the controlling links from about 20 leased line and dial-upus to the controlling links from abou

ICL 4-70 and 4-72 mainframes The Computer Department

computer software for offine

"dumb" COM devices. Howard

scribe minicomputer softw:

for offline "intelligent" C@

Rothumsted will use Cori Pascal and Prime Mac. Assembler on the (35,000 m

And they could do the same for

V77s may be small but their capacity for

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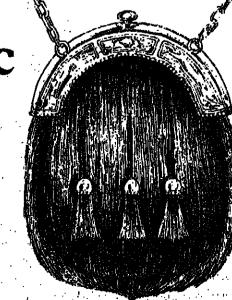
tion flexibility so far unequalled by my

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bank balance, learn more about the Sperry Univac V77 series. Call the Marketing Director on 01-961 2110. Or drop him a line at, Sperry Univac Centre, London NW10 8LS,

hard work isn't.

# **Sperry Univac** has finally replaced the sporran.



The Scots have always had a reputation for looking after their money. Sporrans were once considered the best

place to keep cash They're still as canny north of the border but now they've found a safer depository, because Clydesdale Bank together with Sperry Univac have implemented the largest computer system of its kind operated by any UK or US clearing bank .

Just sixteen Sperry Univac V77s and 1500 counter terminals will handle the bank's day to day business quickly and

SERVAL LINIVAC

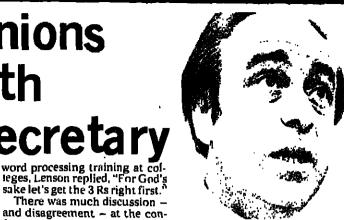
Asked about the need for -Electronic mail solution-

ELECTRONIC mall was one topic

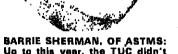
The serious shortage of competent staff in London and the other big cities could be alleviated by Augusting the training work by by exporting the typing work by apporting the typing work by affoctronic mail to where the people are, suggested Pat Coen. While this is done now using yans, and is hopelessly slow, formunicating word processors fould make it effective, he said. A centralised dictating system of the London office could send distance to the

outlying word progessing centre
where the typists would be
based, and typed output could be
produced on remote printers, also
in London. Editing terminals
could also be provided in the
London Office, for ease of making
chances.

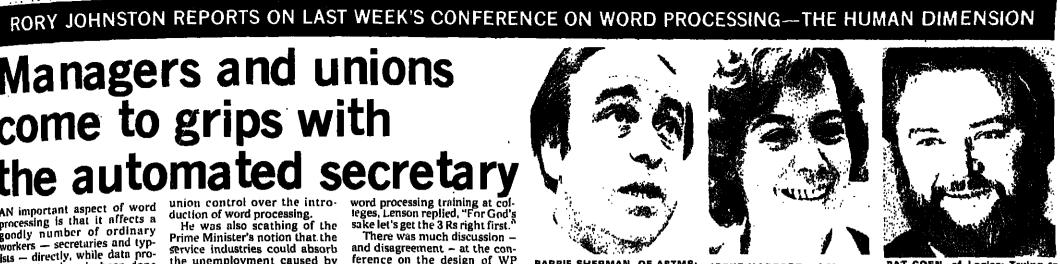
irene Harford described somplex country-wide network already being set up by Massey-Ferguson to link it asparete offices and factories. This would be used by word processors to communicate directly with each other, and started or ther putposes such as factimits and Telex.



BARRIE SHERMAN, OF ASTMS:
Up to this year, the TUC didn't know a silicon chip from a chip butty, but soon things will start to







PAT COEN, of Logica: Trying to introduce word processing at the same time as organisational

### 'Pay more to conventional typist'-

Thus a bad typist can still produce usable work on a WP when his or her productivity on a typewriter

ONE issue which arose at the conference as a result of Barris Sherman's remark that "We want a share", was that of pay rates for word processing operators.

While the unions claim that higher productivity should mean that the typiats are paid more, it was pointed out that typing with a WP needs less skill than with a typewriter, because no matter how many mistakes are made, or how serious they are, they can all be corrected quickly.

might be unacceptably low. Therefore a conventional typist should get more money.

An example was quoted of an author in a London company which had recently installed WP on a large scale. This manager was annoyed about the new system because, he said, his typing was now coming back riddled with errors which he was supposed to correct, wasting a great deal of his time. He claimed them to employ far less competent typists than before.

This is not giving word processiong a good name



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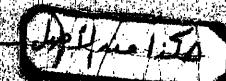
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# IPC bureau's view of an upgrade to a 2900

DME workload to run bench-

marks on a 2960, and the results

were encouraging," Ted Piper, managing director of CDP, told

Computer Weekly. "The 2960

outweighed by the significantly

less good because, for example,

munications overhead under

VME/B than under System 4 J."

He also mentioned I/O error

many processor cycles as it does under J.

for users lulled into a sense of

false security about the ease of

oound jobs is largely

Data Processing Ltd. the company which operates primarily as an in-house bureau for the International Publishing Corporation, is faced with the problem of where to go from its twin System 4/72 mainframes. ystem 4/72 mainframes. processor is less powerful than Plans are to move to DME the 4/72, but the loss on

System 3 on 2960 as an interim step to VME/B. Initally the 2960 faster input-output. However, under VME/B the comparison is will be run under DME for two shifts, switching to development under VME/B for the prime there is much more comshift, so that one System 4 can go next summer. Later, the other System 4 is likely to be replaced

by a larger 2900.

One System 4 is on long lease from ICL, and the other on long lease from a finance company. With ICL no longer offering this kind of lease, the new machines will be third-party financed.

Some preliminary work towards the changeover has

transferring workloads from "It is only true to say that no "We sent a group of operators If youthink you have foundthe mosi cost Colling week and week key lo-disc

system from the world's leading. supplier, and it's not from Inforex, well...

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figuration to your System 4. But if you want to take advantage of things like denser discs, which any user is likely to want, then some conversion is involved.

"It also appears that any prorelease than J1800 have to be recompiled before they will run

"We have just about completed the task of identifying the system which will represent the half of our System 4 workload which we transfer to the 2960, but we have not yet calculated the effort which will be required to do the conversion. For example, there may be tapebased systems which we want to

convert to discs.' Nevertheless the advantages of DME are underlined by a further assessment made at CDP.

required if you transfer to a IBM in, say, five years' time, it machine with an identical con-would almost certainly have | 19), Mr David Allan, the secrebeen cheaper in the interim to go for DME on 2960 rather than

> "But I think you have to make the commitment to go to the native mode of the machine you are using, I hear 1900 users saying that they plan to use DME on 2900 indefinitely, but at some stage they will come up against the problem that there is nobody left with sufficient 1900 expertise to amend those

tem 4 users, since there are fewer of us. In perhaps three to solve our problems. You must have a target date for running entirely in the native mode o



### **Nixdorf** speeds accounts at TV studios

UPDATING from a semimanual accounting system to an Television has installed a Nix-dorf 8870 to replace the NCR 33 ledger card accounting

machines previously used.

The 8870, chosen in preference to an outside bureau service, will enable LWT's accounts depart-ment to handle over 3,000 purchase invoices and about

2,000 journal entries a month. Special software has been written to manage payments to artists for work on productions n the LWT studios.

The LWT system consists of a model N 8870 processor, five VDUs, and 30 Mbytes of disc storage. Another 30 Mbytes of disc will be added later, and it operates under Nixdorf's Comet accounting package.

### Recognition fight

A ONE-DAY stoppage was caled at British Aerospace's Chester computer centre last Friday by members of APEX who are seeking recognition from the company (CW, November 2). The other esta-blished union there, TASS, has said that it will not interfere in the APEX claim, which refers to staff at BAC's Kingston site and those seconded to Chester from there, unless APEX attempts to gain recognition among all staff

Datacoms study

NEARLY 4,000 firms in Europe will soon be contacted to determine their level of data communications usage, for the Eurodata 79 study commissioned earlier this year from Logica (CW, March 9).

Voting rights in the BCS

programs.
"It is even more vital for Sysfive years' time, expertise in System 4 JCL and Usercode will have largely died out, and no one will want to learn it afresh to

restricted to Members and Fel-Market share of graphics business

LETTERS TO THE EDITO

AN item (CW, October 26) raises an interesting mathematical (not to mention marketing) proolem. In it you state that the combined operations of Benson and the graphics division of Va-rian, which Benson has just acquired, are "about half the size of Calcomp's graphics divi-

tary of the Kingston Branch of

the BCS, is quoted as saying that

voting rights for such ex-

perienced staff, not merely

affiliate status as at present." As

a branch officer, he is surely

aware that the only members of

the Society who do not have

voting rights are students and

persons more than four months

n arrears with subscriptions.

Perhaps Mr Allan is confusing

voting rights with eligibility for

election to Council, which is

We want full membership with

You preface this by saying that Benson has "won 50% of the European market for graphics peripherals" and then go on to say that their turnover last year was about \$10 million, world-

When one considers that, according to their recently ublished report and accounts, Calcomp's turnover in Europe

Woking, Surrey.

Neither is there are exam, as Mr Ailan ar

suggest, for persons we join the Society. For

seeking admission to elfocational grades, the saci

mands proof of compete

levels. Having page examination in release.

jects is one way of prot part of such evidence, has

which \$18 million az

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the only one.

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# MICRO NEWS VISITS NATIONAL SEMICONDUCTOR IN CALIFORNIA

These days the microprocessor means more than just the "chip", now so much in vogue in the national Press. The semiconductor companies know that the fundamental key to the merketplace is not just technological development with hardware, but also considerable strength in software. In common with other manufacturers, National NEWBURY.

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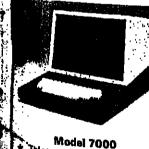


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with its 8086 part, and Zilog, with the Z8000. The National device, according to Raphael, will require a limited number of new peripheral devices. In particular, there will be a requirement for a memory manage-

Thus far the company tracks the route being trod by Zilog. The new part will, however, still be dependent to a considerable degree on the peripheral chips already available for National's second source 8080 microprocessor, "to protect", as phael puts it, "our investment

This is an area where National already heavily committed.

The company is pursuing developments on both the 16-bit and 8-bit front, making use of its XMOS process. This, like the HMOS now being used by Intel, uses a scaling process to reduce component geometries. This makes used of the photolithographic techniques that are a fundamental part of semicon-ductor manufacturing at present, photographically reducing the physical size of the chips

for Pascal,

some in the US as the "people's

language" seems set to become a real force in the world of com-

plex microprocessors over the next two years. During this time, the new ranges of 16-bit devices

will start coming on to the mar-

ket in volume, and another ma-

jor manufacturer entering the fray, National Semiconductor, is

gearing itself to support the language.

The device on which it will

run has yet, officially, to

receive a designation, but

according to Howard Raphael,

microprocessor marketing

director with National, the com-

pany is committing itself to the

support of the language on a 16-bit micro that will be broadly

similar both to Zilog's Z8000 and Motorola's 68000 devices.

Raphael was keen to point out that National's development efforts were predominantly geared to producing what he referred to as "third generation" devices, both in the 16-bit and 8-bit arenas. Though he would say little about the 8-bit deve-lopment work, beyond the fact that some announcement "was a possibility", he was more willing to talk about the company's plans in the third generation 16-bit marketplace.

The XMOS-processed device has already been scheduled for a launch during the first half of 1979, and will have several characteristics in common with the other complex 16-bit processors that have launch dates coming

It will, for example, be able to address a significant amount of memory directly, though Raphael would not be drawn on ow much, and it will feature 32 blt characteristics. Again Raphael would not be drawn. but this seems to be a reference to 32-bit memory addressing, while functioning on 16-bit data.

The overall concept of the device was set out by Raphael in these words: "The third generacombination of current computer architecture and the advances that are possible through technological development. Where necessary, they should also include some of these characteristics already developed for 8-bit devices."

He suggested that National's entry into the fray would produce a device with between 10 and 20 times the performance of currently available 8-bit micro-

bit devices. It is, according to Raphael, an area where National has done well, especially with its high speed version of the 2901 processor using the company's Schottky Coupled Logic, SCL. process. This, a similar design process to ECL, is used in the arithmetic logic unit of the processor to provide a higher pro-

cessing speed.

igh speed".

vice, due to be launched by

make use of this process. One,

ne terms as being "very, very

Back to the subject of Pascal,

nions that the movement

towards the language is growing

National late this year, wil

marketing director, spoke to Micro News editor MARTIN BANKS at the company's world head-quarters in Sente Clare, Californie, about its plan-

ned developments in the 16-bit processor market, and in high level language support — in particular, the support of Pascal.

the 2903A, is categorised by Raphael as being a "very high speed processor". The other part is designated the 2910A, which

Though it is only a second source supplier of the Intel pro-

Previous objections to high level lenguages on microcomputers have centred around the fact that they are code inefficient and have little in the way of a real-time capability. The new 16-bit devices, when they are on the market. will help to change

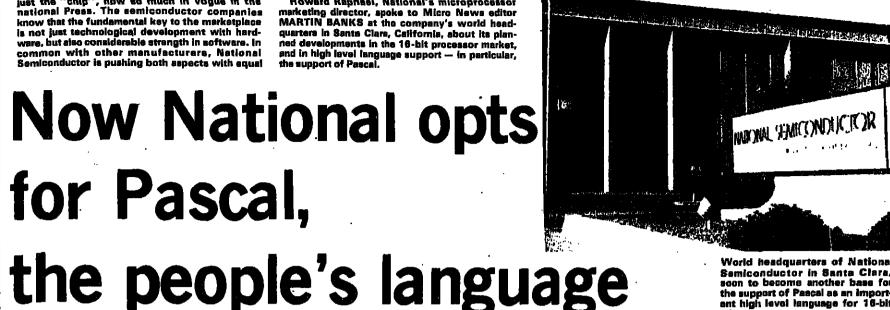
cessor chip, it now claims to have a larger selection of use with the part than Intel.

In general terms, Raphael now divides the micro market into distinct sectors. These start with what he defines as the very low end, which covers the low cost microcontroller area where delow end market, which he dewith less than 4K of memory, a strong I/O orientation, and a chip count of less than six de-

The biggest single market area Raphael calls the midrange. Taking about 50% of the total microprocessor systems market, this is given over to the 8080; Z80 and 6800 family of processors, usually with bet-ween 8 and 12K bytes of

The final two sectors, which are by no means the largest, but of growing interest to National, are the high end market, and the bit slice market. The former, which Raphael says covers applications requiring large interest with the forthcoming introduction of its own new 16bit part. The slice market, where

National both second sources the AMD 2900 family and produces its own versions of the part, is small. It is, however National seems to be following at about 20% a year at proving at about 20% a year at present, and is showing he signs lowing a line between the intellocation of tailing of despite the



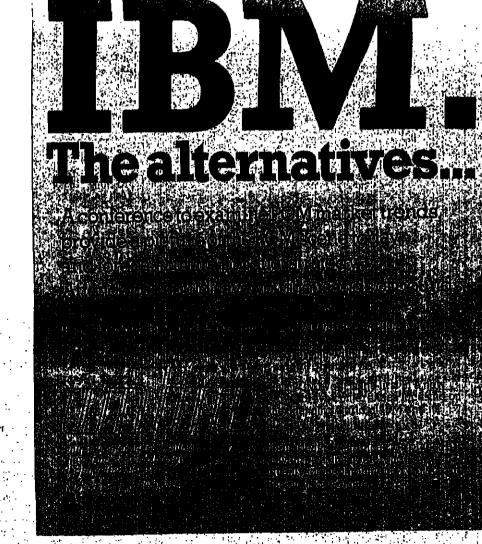
World headquarters of National Semiconductor in Santa Clara, soon to become another base for the support of Pascal as an import-ant high level language for 16-bit

company will be diminishing it

current software support opera-

tions with Basic and Fortran. With Basic, for example, the company is currently gearing up to launch a version of its 64K ROM that will hold the Microsoft 8K byte Basic interpreter as firmware. This will complement National's existing offering in the firmware market, a 32K ROM holding National's own 4K byte simple Basic, called

real time capability," he said. This combination of develop-"The new 16-bit devices, when ments in firmware modules, and increasing efforts in software they are on the market, will help Another important reason for support constitute a concerted attack by National on the cost of the move to Pascal, according to software generation. With Raphael, is the ease of adapta-Pascal, the company is pushing a tion for people who have already frontal attack, trying to make Its other advantage, of course, high level languages more Raphael confirmed other opi- is that it does offer a real time efficient, and with the firmware modules, it is moving towards the development of firmware This move by National does applications packages.



He points to several reasons why the Pascal "movement" is

gaining pace. One is directly

geared to coming of the more

powerful microprocessors. "Pre-

vious objections to high level

languages on microcomputers

have centred around the fact

that they are code inefficient,

and have little in the way of a

learned to program in Basic.

to change this situation."

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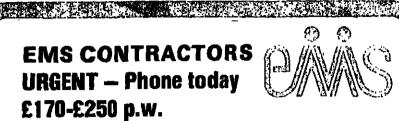
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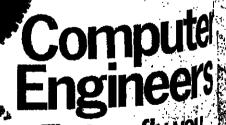
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